Rother District Level 1 Strategic Flood Risk Assessment

Final Report

November 2024

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Rother District Council

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Revision history

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This report describes work commissioned by Holly Harrison of Rother District Council, by a contract dated 11 April 2024. Ed Hartwell and Grace Sheppard of JBA Consulting carried out this work.

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Purpose

This document has been prepared as a Final report for Rother District Council. JBA Consulting accepts no responsibility or liability for any use that is made of this document other than by the Client for the purposes for which it was originally commissioned and prepared. JBA Consulting has no liability regarding the use of this report except to Rother District Council.

Acknowledgements

We would like to acknowledge the assistance of Rother District Council, East Sussex County Council, The Environment Agency, Southern Water, Romney Marshes Area Internal Drainage Board, Pevensey and Cuckmere Water Level Management Board and the neighbouring authorities of Hastings Borough Council, Wealden District Council, Ashford Borough Council, Folkestone and Hythe District Council and Tunbridge Wells Borough Council.

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Executive summary

Introduction

The study area for this Strategic Flood Risk Assessment (SFRA) is the Rother District Council area. The Rother District area is located in the easternmost part of East Sussex, stretching from the coastline well into the High Weald Area of Outstanding Natural Beauty (AONB), covering 51,000 hectares. This 2024 SFRA document supersedes the previous Rother District 2021 Level 1 SFRA. The report has been prepared to provide comprehensive and supporting evidence for the Local Plan 2020 to 2040.

The SFRA update was required to be compliant with the latest guidance described in the revised National Planning Policy Framework (NPPF) – last updated in December 2023 and accompanying Planning Practice Guidance (PPG) – last updated in August 2022. The 2024 SFRA provides flood risk evidence and long-term strategy to support the management and planning of development, protect the environment and deliver infrastructure. The SFRA supports the selection of site allocations in Local Plan reviews and provides information and guidance to be used in the preparation of Flood Risk Assessments in support of site-specific planning applications.

In producing this document, Rother District Council have worked in partnership with key stakeholders and the document has been reviewed and approved by Rother District Council, East Sussex County Council, the Environment Agency, Pevensey and Cuckmere Water Level Management Board and Romney Marshes Area Internal Drainage Board.

SFRA objectives

The key objectives of the 2024 SFRA are:

- To assess the flood risk to and from the study area from all sources, now and in the future (accounting for climate change).
- To assess the impact that cumulative land use changes and development in the area will have on flood risk.
- To identify and provide recommendations on opportunities to reduce the causes and impacts of flooding to existing communities and developments.
- To identify land usage for flood risk management.

Levels of SFRA

The Planning Practice Guidance advocates a tiered approach to risk assessment and identifies the following two levels of SFRA:

1. Level One: where flooding is not a major issue and where development pressures are low. The assessment should be sufficiently detailed to allow application of the Sequential Test.
2. Level Two: where land outside Flood Zones 2 and 3 cannot appropriately accommodate all the necessary development creating the need to apply the National Planning Policy Framework's Exception Test. In these circumstances the assessment should consider the detailed nature of the flood characteristics within a Flood Zone and assessment of other sources of flooding.

This report fulfils the Level One SFRA requirements. The identification of potential development sites has been carried out within the District and the Level 1 SFRA site screening and cumulative impact assessment has been completed at this stage.

How to use this document

SFRAs are high level strategic documents and, as such, do not go into detail on an individual site-specific basis. This SFRA has been developed using the best available information, supplied at the time of preparation. This relates both to the current risk of flooding from rivers and surface water and where available the potential effects of future climate change.

It should be noted that datasets used to inform this SFRA may be periodically updated and following the publication of this SFRA, new information on flood risk may be provided by Risk Management Authorities. Therefore prior to producing a site-specific Flood Risk Assessment developers should consult Risk Management Authorities to ascertain the latest available data.

Recommendations and details on how to apply the Sequential and Exception tests using the data set out in this report are provided in Appendix O - Guide to using Technical Data and Appendix P –Methodology in support of performing the Sequential Test.

Flood risk policy and strategy

There are many relevant regional and local policies which have been considered within the SFRA, such as the Shoreline Management Plan for South Foreland to Beachy Head, Catchment Flood Management Plans for Rother and Romney, Cuckmere and Sussex Havens and Medway, the South East River Basin District Flood Management Plan, the East Sussex Local Flood Risk Management Strategy and Preliminary Flood Risk Assessment and Surface Water Management Plans for Battle, Bexhill and Rye. Other policy considerations have also been incorporated, such as sustainable development principles, climate change and flood risk management.

Planning policy for flood risk management

The **National Planning Policy Framework** (NPPF) and associated **Planning Practice Guidance** (PPG) have been reviewed in terms of their requirements as to how flood risk and surface water drainage should be managed through the planning system, and how these policies should be implemented. Proposed development sites at locations at risk of flooding will be required to satisfy the Sequential and, where necessary, Exception Tests in accordance with the NPPF. Details on how to apply the sequential and exception tests using the data in this report are set out in Appendix O -Guide to using Technical Data. Additionally, links have been provided for various guidance documents and policies published by other Risk Management Authorities such as the Lead Local Flood Authority and the Environment Agency.

Climate change

The interpretations of flood risk in the SFRA have considered the impacts of climate change on the Plan area in the future. It should be noted that the UK Climate Change Projections 2018 (**UKCP18**) were published on 26 November 2018. The UKCP18 projections replace the UKCP09 projections as the official source of information on how the climate of the UK may change over the next 100 years. The latest updates to the **climate change allowances guidance** occurred in May 2022, with an update to peak rainfall allowances. When undertaking an FRA, reference should be made to the most up to date climate change allowances provided by the Environment Agency.

Sources of information used in preparing the SFRA

The SFRA has collated flood risk information from a number of key sources to understand flood risk within the Plan area. This includes the definition of Flood Zones that has been made as part of the SFRA. Other datasets such as the Risk of Flooding from Surface Water (RoFSW) mapping have also been analysed as well as records of historic flood incidents, reservoir inundation, groundwater flooding and sewer flooding incidents.

The Environment Agency regularly reviews its flood risk mapping. It is important that they are approached to determine whether updated (more accurate) information is available prior to commencing a site-specific FRA.

Refer to the SFRA guide to using technical data in Appendix O and P for recommendations and details on how to apply the Sequential and Exception tests using the data set out in this section.

Understanding flood risk in Rother District

The key sources of flooding in the district have been fully explored in terms of their potential impacts. This includes the factors that affect flooding such as topography, soils and geology.

- There have been several recorded flood incidents across Rother District, with the most frequent source of flooding being fluvial in the upper catchment, tidal along the coastline and a combination of both fluvial and tidal in the lower catchment. Notable incidents occurred in 2000 and 2013/14. These incidents were largely caused by the overtopping of watercourses, following heavy or prolonged rainfall, and tidal storm surges.
- The River Rother, River Brede and River Tillingham are the main watercourses within the Local Plan area identified to be contributing to fluvial flood risk. They are all susceptible to tidal locking in their lower reaches, along with Combe Haven, East Stream and Picknell Green Stream. Key settlements identified to be at risk of fluvial flooding include Robertsbridge, Salehurst, Etchingham and Rye.
- The Local Plan area is bound by the English Channel to the south, with the coastline at risk of tidal flooding. Tidal flooding has been recorded in Rye Harbour and Camber due to the overtopping of defences.
- Coastal flood risk will potentially increase where coastal erosion threatens the stability of tidal flood defences.
- The Environment Agency's Risk of Flooding from Surface Water dataset shows that surface water flood risk is predominantly concentrated along topographical flow paths of existing watercourses, dry valleys or roads, with some areas of pooling e.g. upslope of topographic features such as railway lines. In coastal areas, surface water flood risk is also related to areas where the water table lies close to the surface increasing ground saturation and tidal outfalls where tide-locking can restrict the discharge from gravity sewers and culverted watercourses.
- The JBA Groundwater Flood Map shows that the majority of the Local Plan area is at a negligible risk of groundwater emergence. However, small areas of higher risk include marshland surrounding Rye Harbour and Camber, where there is also potential for saline intrusion. There are also localised perched aquifers, where gravels and sands are underlain by clay. These can cause significant issues and are generally not captured within the national mapping.
- There have been 5,171 incidents of sewer flooding within the local plan area since 1986, as reported in Sothern Water's Historic flooding records and Sewer Incident Report Form (SIRF). It has been identified that the areas of Bexhill-on-Sea, Battle, Rye and Robertsbridge are the most susceptible to sewer issues.
- There are six reservoirs located within the Local Plan area (The Ashburnham Lakes (Reservoir Pond, Front Water and Broad Water), Bewl Water Reservoir, Darwell Reservoir and Powdermill Reservoir). Additionally, reservoirs located outside of the Local Plan area but also pose a risk of flooding include Wadhurst Park Lake Reservoir, Wishing Tree Reservoir and Morghew Reservoir. Outlines from the Risk of Flooding from Reservoirs dataset show worst case inundation extents that impact Rother District, however there are no recorded incidents of breach within the study area

Fluvial, tidal and coastal flood defences

There are fluvial, tidal, fluvial/tidal and coastal flood defences located along the majority of the coastline and main watercourses within the Local Plan area. Predominant types of defences include embankments, high ground, flood walls, beaches and dunes. The standard of protection provided by these assets varies from 50% (i.e. protection will be provided for an event with an annual exceedance probability of up to 50%) up to 0.25%. A significant proportion of these defences are classed as "high ground" which can be the natural ground

level, as a result some of the defences have a relatively low standard of protection. There is also a variance in their condition.

FRA requirements and flood risk management guidance

Site specific FRAs are required by developers to provide a greater level of detail on flood risk and any protection provided by defences and, where necessary, demonstrate the development satisfies part 'b' of the Exception Test.

Information which should be used to support the Sequential and Exception Tests for both Local Plans and Flood Risk Assessments has been documented, along with guidance for planners and developers. Links have been provided for various guidance documents and policies published by other Risk Management Authorities such as the Lead Local Flood Authority and the Environment Agency.

Developers should consult with Rother District Council, East Sussex County Council, the Environment Agency, Southern Water and (where relevant) Romney Marsh Area Internal Drainage Board and Pevensey and Cuckmere Water Level Management Board at an early stage to discuss flood risk including requirements for site-specific FRAs, detailed hydraulic modelling, and drainage assessment and design.

Surface water management and SuDS

Advice and guidance on managing surface water runoff and flooding throughout Rother District has been provided. This includes specific advice relating to the use of Sustainable Drainage Systems (SuDS), these are management practices which enable surface water to be drained in a more sustainable manner and mimic the local natural drainage. The inclusion of SuDS within developments is an opportunity to enhance ecological and amenity value, and promote Green Infrastructure, incorporating above ground facilities into the development landscape strategy.

Planners should be aware of the conditions set by East Sussex County Council as the Lead Local Flood Authority for surface water management and ensure development proposals and applications are compliant with the **Guide to Sustainable Drainage Systems in East Sussex**, which can be found on East Sussex County Council's **Sustainable Drainage Systems** webpage.

Flood warning and emergency planning

Emergency planning has been considered as part of the SFRA, this includes guidance and advice on managing flood related incidents before, during and after flooding occurs. The NPPF requirements have also been reviewed with regard to emergency plans and making new development safe. There are currently 11 Flood Alert Areas and 17 Flood Warning Areas in the Local Plan area, a full description of the areas and waterbodies affected by these has been provided.

Strategic flood risk solutions

Consideration has been made to the potential for strategic flood risk solutions within Rother District and how these could potentially be implemented. Potential solutions include flood storage, natural flood management, promotion of SuDS and floodplain restoration.

Recommendations for development and flood risk in the district

A review of national and local policies has been conducted against the information collected on flood risk in this SFRA. Following this, several recommendations have been made for Rother District Council to consider as part of Flood Risk Management in the study area.

- Reduction of flood risk through site allocations and appropriate site design;
- Promote SuDS to mimic natural drainage routes to improve water quality;

- Reduce surface water runoff from new developments and agricultural land;
- Enhance and restore river corridors and habitat; and
- Mitigate against risk, improved emergency planning and flood awareness.

Local Plan policy recommendations

The policies in the **Rother District Local Plan Core Strategy** and the **Development and Site Allocations Local Plan** (DaSA) have been reviewed against the findings of the SFRA. The following additional policies and updates to existing policies are recommended for the Local Plan:

- Buffer Strips Policy;
- Coastal Flood Risk Policy;
- Internal Drainage Boards Policy; and
- Sustainable Drainage Policy (additions to Policy DEN5).

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Abbreviations and glossary of terms

	Definition
AEP	Annual Exceedance Probability - the chance of an event with a particular magnitude occurring in each and every year
ADEPT	Association of Directors of Environment, Economy, Planning and Transport
AOD	Above Ordnance Datum
AONB	Area of Natural Beauty
BSI	British Standards Institution
CFMP	Catchment Flood Management Plan
CIRIA	Construction Industry Research and Information Association
Defra	Department of the Environment, Food and Rural Affairs
ESCC	East Sussex County Council
FAA	Flood Alert Area
FCERM GiA	Flood and Coastal Erosion Risk Management Grant in Aid
FRA	Flood Risk Assessment
FRMP	Flood Risk Management Plan
FSA	Flood Storage Area
FWMA	Flood and Water Management Act
FWA	Flood Warning Area
FWS	Flood Warning Service
GI	Green Infrastructure
GIS	Geographical Information System
GSPZ	Groundwater Source Protection Zone
HELAA	Housing and Economic Land Availability Assessment - The Housing and Economic Land Availability Assessment (HELAA) is a technical piece of evidence to support local plans and Sites & Policies Development Plan Documents (DPDs). Its purpose is to demonstrate that there is a supply of housing land in the district which is suitable and deliverable.
JBA	Jeremy Benn Associates
LFRMS	Local Flood Risk Management Strategy
LLFA	Lead Local Flood Authority - Local Authority responsible for taking the lead on local flood risk management
LPA	Local Planning Authority
Main River	A watercourse shown as such on the Main River Map, and for which the Environment Agency has responsibilities and powers
NFF	National Flood Forum
NFM	Natural Flood Management
NPPF	National Planning Policy Framework
PPG	Planning Practice Guidance
NRD	National Receptor Database
NRIM	National Reservoir Inundation Mapping

	Definition
NVZ	Nitrate Vulnerable Zones
Ordinary Watercourse	All watercourses that are not designated Main River. Local Authorities or, where they exist, IDBs have similar permissive powers as the Environment Agency in relation to flood defence work. However, the riparian owner has the responsibility of maintenance.
PFRA	Preliminary Flood Risk Assessment
RBMP	River Basin Management Plan
RDC	Rother District Council
Resilience measures	Measures designed to reduce the impact of water that enters property and businesses; could include measures such as raising electrical appliances.
Resistance measures	Measures designed to keep flood water out of properties and businesses; could include flood guards for example.
RoFSW	Risk of Flooding from Surface Water
SFRA	Strategic Flood Risk Assessment
SIRF	Sewer Incident Report Form – Southern Water's database of sewer flooding incidents
SuDS	Sustainable Drainage Systems
SWMP	Surface Water Management Plan
TUFLOW	Two-dimensional Unsteady FLOW (a hydraulic model)
UKCP18	United Kingdom Climate Projections 2018
WFD	Water Framework Directive

1 Introduction

1.1 Study Area

This Strategic Flood Risk Assessment (SFRA) covers the study area of Rother District. The SFRA study area is shown in Figure 1-1. Rother District is located in the easternmost part of East Sussex, stretching from the coastline well into the High Weald, covering 51,000 hectares. The District derives its name from the River Rother, which flows through the northern section of the District before reaching the English Channel at Rye.

The SFRA study area is shown in Figure 1-1, as well as its location within the administrative boundary of East Sussex County Council, who form the Lead Local Flood Authority (LLFA) for the area. The administrative area of Rother District Council is neighboured by Hastings Borough Council, Wealden District Council, Ashford Borough Council, Folkestone and Hythe District Council and Tunbridge Wells Borough Council, as shown in Figure 1-2, Figure 1-3 and Figure 1-4 demonstrate the administrative boundaries of water and sewerage providers and Internal Drainage Boards respectively, within the study area.

1.2 Purpose of the Strategic Flood Risk Assessment

> "Strategic policies should be informed by a strategic flood risk assessment, and should manage flood risk from all sources. They should consider cumulative impacts in, or affecting, local areas susceptible to flooding, and take account of advice from the Environment Agency and other relevant flood risk management authorities, such as lead local flood authorities and internal drainage boards."
>
> (National Planning Policy Framework (July 2021, updated December 2023), Section 14 paragraph 166)

This SFRA 2024 document supersedes the previous Rother District Council Level 1 SFRA (2021).

The main purpose of this SFRA update is to prepare a document that provides comprehensive and supporting evidence for the emerging Local Plan Review. Rother District Council adopted its **Local Plan Core Strategy** in 2014, with an additional Development and Site Allocations Local Plan (DaSA) adopted in 2019. Rother District Council is currently in the process of carrying out a five-year update as required by the plan making regulations. As part of ensuring that a robust evidence base is in place, the Council requires a new SFRA to be produced. The SFRA will influence the location of development. The SFRA update was also required to be compliant with the latest guidance described in the 2023 update to the National Planning Policy Framework (NPPF), support the selection of site allocations in the Local Plan Review and to provide information and guidance to be used in the preparation of Flood Risk Assessments (FRAs) in support of site specific planning applications. The evidence in this SFRA shall also be used to support the formulation of Neighbourhood Plans.

An **updated NPPF** was published in July 2021 (and subsequently amended in December 2023) and sets out Government's planning policies for England and how these are expected to be applied. This updated Framework replaces the previous versions of the NPPF published in July 2018 and March 2012.

The key objectives of the 2024 SFRA are:

- To provide a robust evidence base to inform the application of the Sequential, and if necessary, Exception Tests for developers and planners.

- To assess the flood risk to and from the study area from all sources, now and in the future (accounting for climate change).
- To assess the impact that cumulative land use changes and development in the area will have on flood risk.
- To identify and provide recommendations on opportunities to reduce the causes and impacts of flooding to existing communities and developments.
- To identify land usage for flood risk management.

The SFRA has been completed in line with the guidance from DEFRA and the Environment Agency titled **'How to prepare a strategic flood risk assessment'** (last updated March 2022).

1.3 Levels of SFRA

The Planning Practice Guidance advocates a tiered approach to risk assessment and identifies the following two levels of SFRA:

1 Level One: where flooding is not a major issue and where development pressures are low. The assessment should be sufficiently detailed to allow application of the Sequential Test.

2 Level Two: where land outside Flood Zones 2 and 3 cannot appropriately accommodate all the necessary development creating the need to apply the NPPF's Exception Test. In these circumstances the assessment should consider the detailed nature of the flood characteristics within a Flood Zone and assessment of other sources of flooding.

This report fulfils the Level One SFRA requirements.

1.4 SFRA outputs

To meet the objectives, the following outputs have been prepared:

- Inform the development of the Sustainability Appraisal through the Local Plan process.
- Inform the preparation of flood risk policy and guidance.
- Identify the requirements for site-specific Flood Risk Assessments.
- Assess the cumulative impact that development or changing land use would have on the risk of flooding.
- Identify opportunities to reduce the causes and impacts of flooding to existing communities and developments.
- Identify any land likely to be needed for flood risk management features.
- Determine the acceptability of flood risk in relation to the study areas emergency planning capabilities.

1.5 Structure of this report

Table 1-1: SFRA report contents

Section	Contents
1 - Introduction	Provides a background to the study, defines objectives, outlines the approach adopted and the consultation performed.
2 - Flood Risk Policy and strategy	Includes information on the implications of recent changes to planning and flood risk policies and legislation, as well as documents relevant to the study.
3 - Planning policy for flood risk managementPlanning policy for flood risk management	Describes the Sequential Approach and application of Sequential and Exception Tests. Outlines cross-boundary issues and considerations.
4 - Climate change	Outlines climate change guidance and the implications for the study area.
5 - Sources of information used in preparing the SFRA	Outlines what information has been used in the preparation of the SFRA.
6 - Understanding flood risk in the Rother District	Introduces the assessment of flood risk and provides an overview of the characteristics of flooding affecting the district. Provides a summary of responses that can be made to flood risk, together with policy and institutional issues that should be considered.
7 - Fluvial, tidal and coastal flood defences	Assessment of existing flood defences and flood risk management measures
FRA requirements and flood risk management guidance	Identifies the scope of the assessments that must be submitted in FRAs supporting applications for new development. Provides guidance for developers and outlines conditions set by the LLFA that should be followed.
9 - Surface water management and SuDS	Advice on managing surface water run-off and flooding and the application of SuDS.
10 - Flood warning and emergency planning	Outlines the flood warning service in the Local Plan area and provides advice for emergency planning, evacuation plans and safe access and egress.
11 - Strategic flood risk solutions	Overview of possible strategies to reduce flood risk
12 - Level 1 summary assessment of potential development locations	As the identification of potential development sites is currently underway within the District, the Level 1 site screening and cumulative impact assessment has not been carried out at this stage. Once completed an addendum will be produced to assess the extent of flood risk to individual sites.
13 - Summary	Review of the Level 1 SFRA.
14 - Recommendations	Identifies recommendations for the council to consider as part of Flood Risk Management policy based on finding of the study to date.
Appendix A-M: Flood risk mapping	Maps showing flood risk information from all sources
Appendix N: Site screening results	Site screening spreadsheet identifying the proportion of each potential development site at risk of flooding from different

Section	Contents
	sources.
Appendix O: Guide to using technical data	Table advising developers on how to use the available flood risk information.
Appendix P: Methodology in support of performing the Sequential Test	Document describes the recommendations for the preferred approach and sets out a complete assessment of the implications so that consideration can be given to the consequences.

1.6 Consultation

The following stakeholders have been consulted during the preparation of this Level 1 SFRA:

- Rother District Council
- Environment Agency
- East Sussex County Council- this administrative area can be seen in Figure 1-1.
- Neighbouring authorities: (Hastings Borough Council, Wealden District Council, Ashford Borough Council, Folkestone and Hythe District Council and Tunbridge Wells Borough Council) – these can be seen in Figure 1-2.
- Southern Water, Affinity Water and South East Water- these can be seen in Figure 1-3.
- Romney Marshes Area Internal Drainage Board and Pevensey and Cuckmere Water Level Management Board- these can be seen in Figure 1-4.

Rother District Council have worked in partnership with the stakeholders and the document has been reviewed and approved by Rother District Council, East Sussex County Council, the Environment Agency, Pevensey and Cuckmere Water Level Management Board and Romney Marshes Area Internal Drainage Board.

1.7 Use of SFRA data

Level 1 SFRAs are high-level strategic documents and do not go into detail on an individual site-specific basis. The primary purpose is to provide an evidence base to inform the Local Plan and any future flood risk policies.

Developers will still be required to undertake site-specific Flood Risk Assessments to support Planning Applications. Developers will be able to use the information in the SFRA to scope out the sources of flood risk that will need to be explored in more detail at site level.

Appendix O and Appendix 149 contain a guide to using the technical data presented within this SFRA, further explaining how SFRA data should be used, including reference to relevant sections of the SFRA, how to consider different sources of flood risk and recommendations and advice for Sequential and Exception Tests.

Hyperlinks to external guidance documents/ websites are provided in **Green** throughout the SFRA.

Advice to users has been highlighted in **amber boxes** throughout the document.

On the date of publication, the SFRA contains the latest flood risk information. Over time, new information will become available to inform planning decisions, such as updated hydraulic models (which then update the Flood Map for Planning), flood event information, new defence schemes and updates to policy and legislation. Developers should check the online Flood Map for Planning in the first instance to identify any major changes to the Flood Zones.

Figure 1-1: SFRA study area and the Lead Local Flood Authority

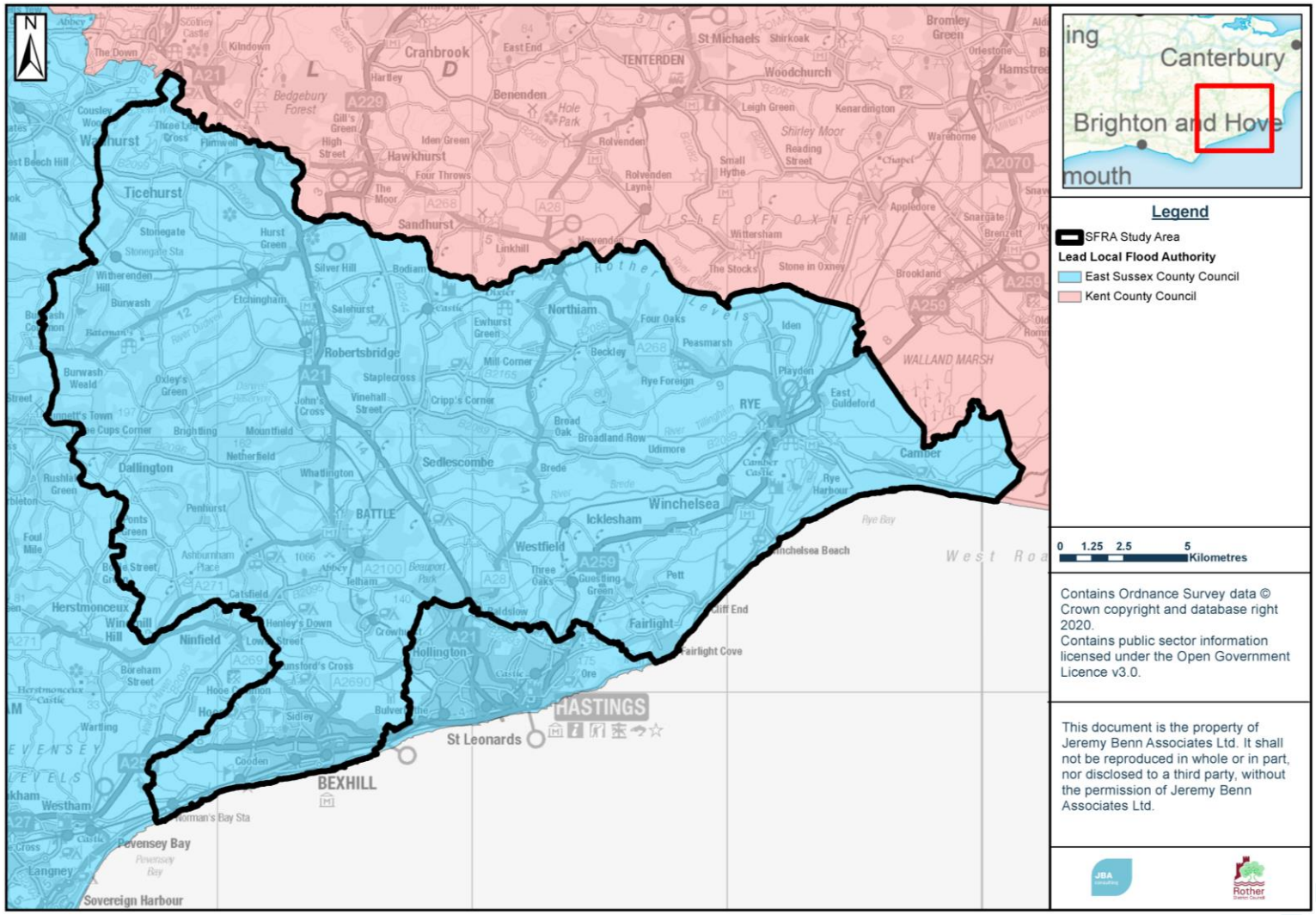


Figure 1-2: SFRA study area and the neighbouring authorities

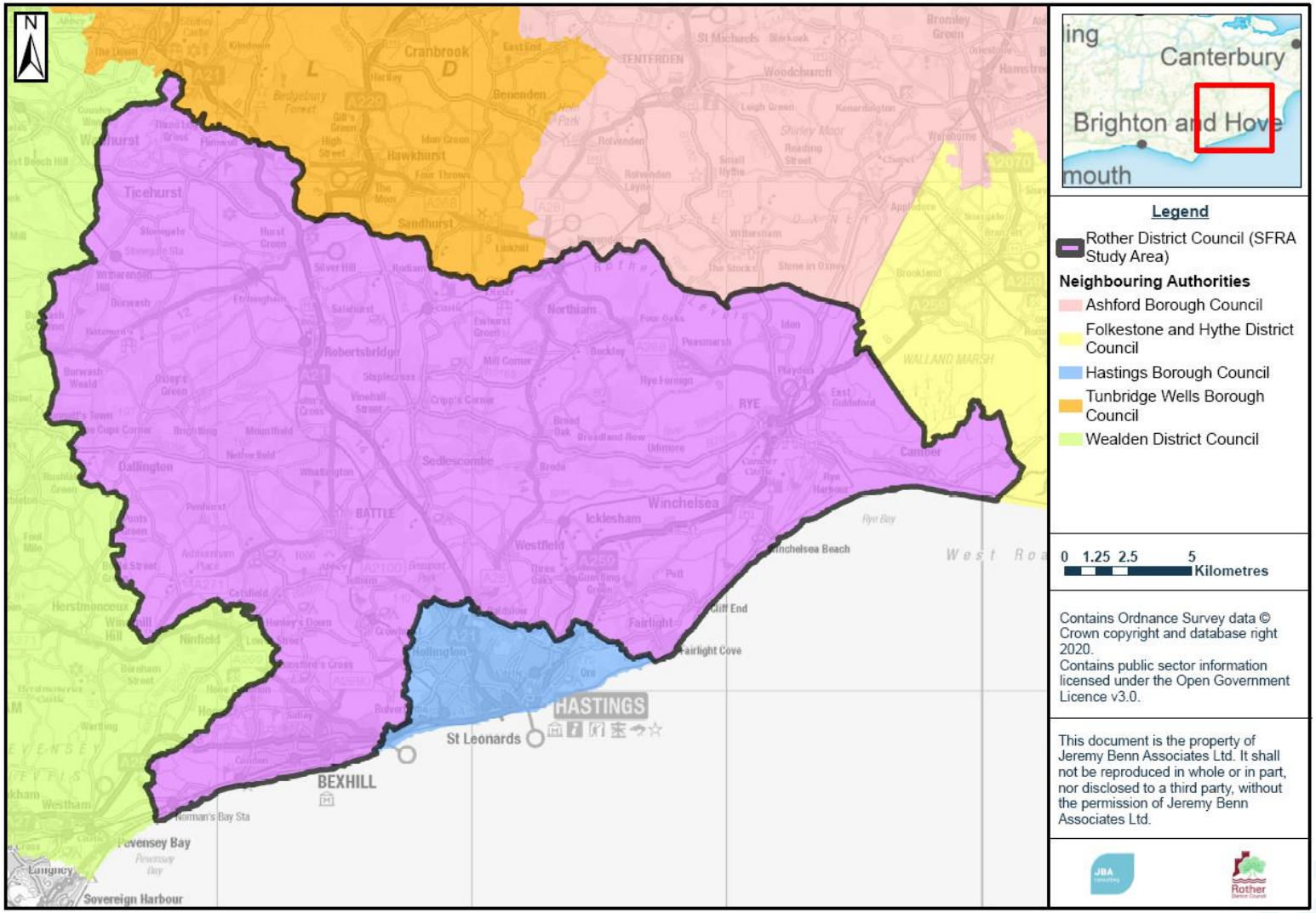


Figure 1-3: SFRA study area and water and sewerage providers

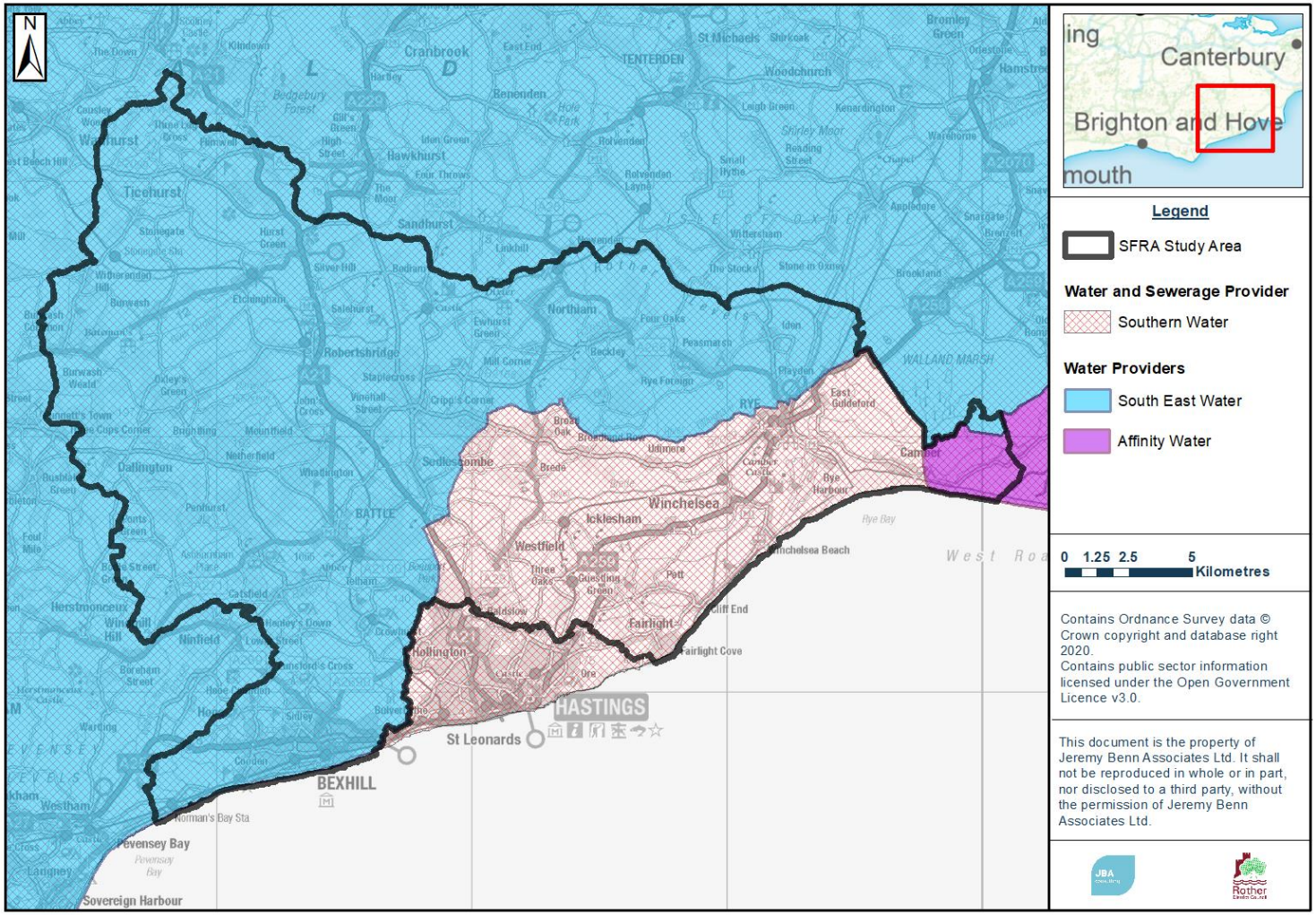
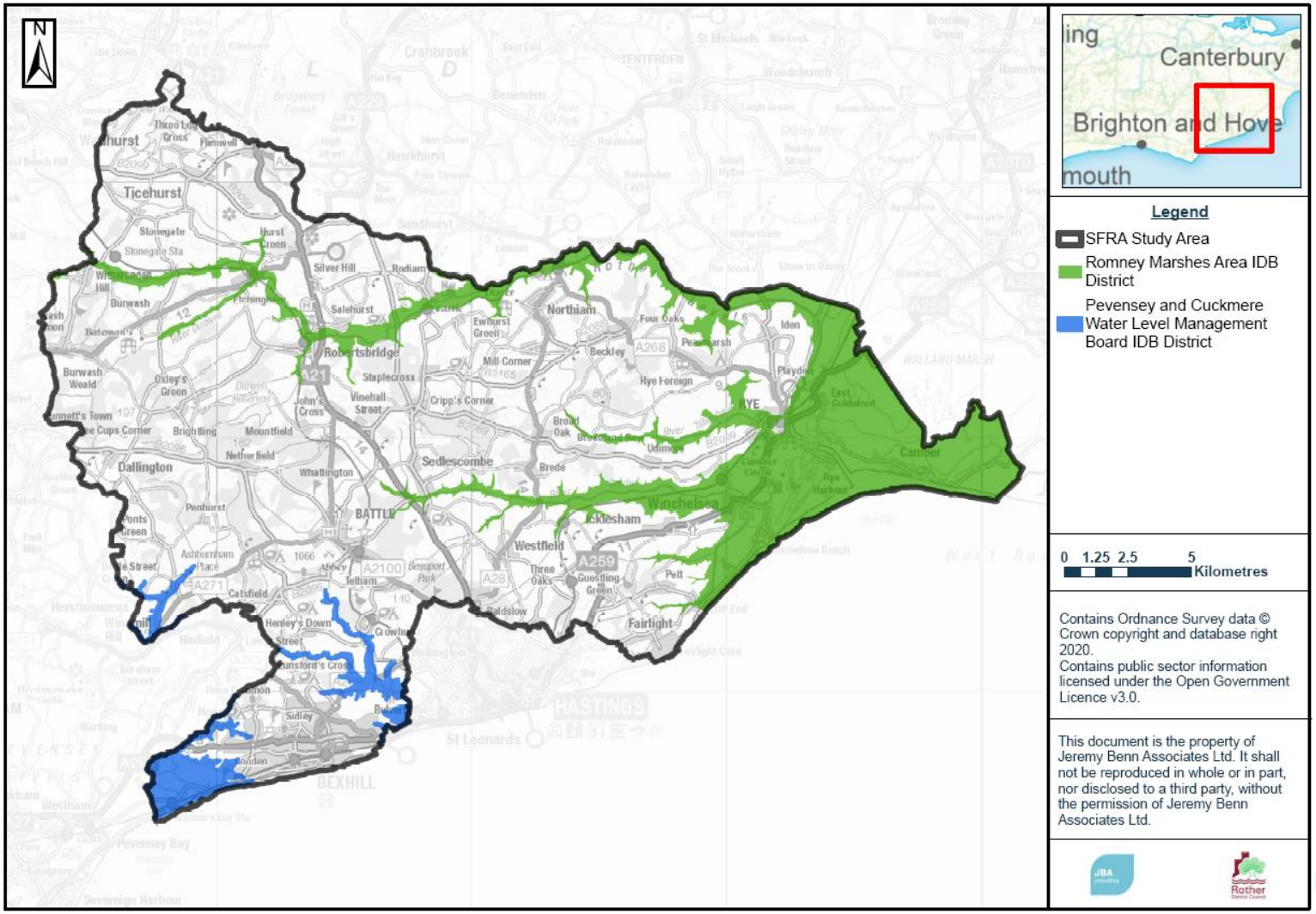


Figure 1-4: SFRA study area and Internal Drainage Boards



2 Flood Risk Policy and strategy

This section sets out the Flood Risk Management roles and responsibilities for different organisations and relevant legislation, policy and strategy

2.1 Roles and responsibilities for Flood Risk Management in Rother District

There are different organisations that cover Rother District that have responsibilities for flood risk management, known as Risk Management Authorities (RMAs). These are shown on Table 2-1, with a summary of their responsibilities.

It is important to note that land and property owners are responsible for the maintenance of watercourses either on or next to their properties. Property owners are also responsible for the protection of their properties from flooding as well as other management activities, for example by maintaining riverbeds/banks, controlling invasive species and allowing the flow of water to pass without obstruction. More information can be found in the Environment Agency publication **'Owning a Watercourse' (2018)**.

Table 2-1: Risk Management Authorities

Risk Management Authority	Strategic Level	Operational Level	Planning role
Environment Agency	• Strategic overview for all sources of flooding • National Strategy • Reporting and general supervision	• Main rivers (e.g. River Rother, River Brede, River Tillingham, Combe Haven etc.) • Sea • Reservoirs	• Statutory consultee for development in Flood Zones 2 and 3
East Sussex County Council (ESCC) as Lead Local Flood Authority (LLFA)	• Preliminary Flood Risk Assessment • Local Flood Risk Management Strategy • Flood Investigations	• Surface Water • Groundwater • Ordinary Watercourses outside of IDBs (consenting and enforcement)	• Statutory consultee for major developments

Risk Management Authority	Strategic Level	Operational Level	Planning role
Rother District Council	• Local Plans as Local Planning Authority	• Determination of Planning Applications as Local Planning Authority • Planning enforcement • Emergency planning • Managing open spaces under District Council ownership • Ordinary watercourses outside of IDBs (works)	• Development of Local Plans • Determination of Planning Applications as Local Planning Authority • Planning enforcement
Internal Drainage Boards • *Pevensey and Cuckmere WLMB* • *Romney Marshes Area IDBs*	• Land Drainage Byelaws	• Ordinary Watercourses (consenting and enforcement) • Ordinary watercourses (works) • Asset management	• Non-statutory consultee
Southern Water	• Asset Management Plans, supported by Periodic Reviews (business cases) • Develop Drainage and Wastewater management plans	• Surface, foul and combined public sewers	• Non-statutory consultee
Highways authorities • *Highways England (motorways and trunk roads)* • *Highway Authority- ESCC* (other*	• Highway drainage policy and planning	• Highway drainage	• Statutory consultee regarding highways design standards and adoptions

Risk Management Authority	Strategic Level	Operational Level	Planning role
adopted roads)			

*the Highway Authority may also be Kent County Council if development sites are on the boundary and have their access road falling within KCC's administrative area.

2.2 Key Legislation for flood and water management

2.2.1 Floods Directive (2007) & Flood Risk Regulations (2009)

The **Flood Risk Regulations** translate the **EU Floods Directive** into UK law. The EU requires Member States to complete an assessment of flood risk (known as a Preliminary Flood Risk Assessment (PFRA)) and then use this information to identify areas where there is a significant risk of flooding. The threshold for designating significant Flood Risk Areas is defined by DEFRA. For these Flood Risk Areas, States must then undertake Flood Risk and Hazard Mapping and produce Flood Risk Management Plans.

The Flood Risk Regulations direct the Environment Agency to do this work for river, sea and reservoir flooding. LLFAs must do this work for surface water, Ordinary Watercourses and groundwater flooding. This is a six-year cycle of work and the second cycle started in 2017. In the instance of this SFRA, the LLFA is East Sussex County Council (ESCC).

The **East Sussex PFRA** (2011) provides information on significant past and future flood risk from localised flooding in East Sussex. An **addendum** to the PFRA was produced by ESCC in 2017.

In 2011 indicative Flood Risk Areas were identified nationally by LLFA's. None encroached on the Rother Local Plan area. The exercise was repeated in 2018 and a further national study prepared to identify potential areas of significant flood risk ("Flood Risk Areas") – '**Review of preliminary flood risk assessments (Flood Risk Regulations 2009): guidance for lead local flood authorities in England – 25th Jan 2017'**. During this review an area in Hastings, south of the Local Plan area, was identified. Similarly, areas of Hastings were identified by the Environment Agency to be a fluvial/coastal Flood Risk Area. These are shown in **online mapping**.

Although no areas within the Rother Local Plan area were identified, Local Plan allocations and developer Flood Risk Assessments should demonstrate appropriate site mitigation measures that will not increase flood risk downstream in Hastings.

As of 31 December 2023. the UK Government has redacted the Flood Risk Regulations (2009) as part of a review into retained EU legislation. This policy has been removed, as the Flood Risk Regulations duplicate existing domestic legislation, namely the Flood and Water Management Act (2010).

2.2.2 Flood and Water Management Act (FWMA) (2010)

The **Flood and Water Management Act (FWMA)** was passed in April 2010. It aims to improve both flood risk management and the way we manage our water resources.

The FWMA has created clearer roles and responsibilities and helped to define a more risk-based approach to dealing with flooding. This included the creation of a lead role for LAs, as LLFAs, designed to manage local flood risk (from surface water, ground water and ordinary watercourses) and to provide a strategic overview role of all flood risk for the EA.

The content and implications of the FWMA provide considerable opportunities for improved and integrated land use planning and flood risk management by LAs and other key partners. The integration and synergy of strategies and plans at national, regional and local scales, is increasingly important to protect vulnerable communities and deliver sustainable regeneration and growth.

2.2.3 Water Framework Directive (2000) & Water Environmental Regulations (2017)

The purpose of the **Water Framework Directive (WFD)**, which was transposed into English Law by the **Water Environment Regulations** (first published in 2003 and updated in 2017), is to deliver improvements across Europe in the management of water quality and water resources. This is enforced through a series of plans called River Basin Management Plans (RBMP) (see section 2.3.3), which were last published in October 2022, updated in December 2022.

Rother District lies within the South East River Basin District.

2.2.4 Environmental Permitting

The **Amendment of the Environmental Permitting Regulations (2018)** set out where developers will need to apply for additional permission (as well as Planning Permission) to undertake works to an Ordinary Watercourse (pollution related works only) or Main River. This includes flood risk activities, for example:

- on or within 8 metres of a main river (16 metres if tidal);
- on or within 8 metres of a flood defence structure or culvert (16 metres if tidal);
- on or within 16 metres of a sea defence;
- involving quarrying or excavation within 16 metres of any main river, flood defence (including a remote defence) or culvert; and
- in a floodplain more than 8 metres from the riverbank, culvert or flood defence structure (16 metres if it is a tidal main river) and you do not already have planning permission.

Environmental permits may also be required from the Environment Agency to discharge runoff, trade effluent or sewage into a main river. They may also be required in relation to groundwater activities, where there may be a risk of groundwater contamination.

An Ordinary Watercourse consent may be required where work is carried out which could affect the flow of water within a watercourse which is not main river. These should be acquired from **East Sussex County Council**, **Pevensey and Cuckmere Water Level Management Board** or **Romney Marshes Area Internal Drainage Board.**

2.2.5 Byelaws

Land Drainage Byelaws outline legal obligations and responsibilities when undertaking works on or close to a watercourse, for the purpose of preventing flooding, or mitigating any damage caused by flooding.

The Rother Local Plan area is covered by the **Southern Region Land Drainage and Sea Defence Byelaws** and enforced by the Environment Agency. These Byelaws have effect on functions relating to land drainage in the Southern Water Authority area for any Main River or sea and tidal defences.

Under the **Land Drainage Act (1991)** Internal Drainage Boards were also given the power to implement their own Byelaws. The **Romney Marshes Area Internal Drainage Board Byelaws** and the **Pevensey and Cuckmere Water Level Management Board development Control Byelaws** both have effect within Rother District. These Byelaws have effect on any activity within the Internal Drainage Board Districts that affect the flow of water and flood risk. The Byelaws are stated to be considered necessary for the following purposes:

- Securing the effectiveness of flood risk management work within the meaning of section 14A of the Land Drainage Act.
- Regulating the effects on the environment of a drainage system
- Securing the efficient working of the drainage system

Compliance with the relevant Byelaws and standards must be demonstrated by any developer planning works within the two IDB's drainage district and watershed (or catchment) within the Local Plan area.

2.2.6 Additional Legislation

Additional legislation relevant to development and flood risk in Rother District include:

- The **Town and Country Planning Act (1990)** and the **Water Industry Act (1991)**. These set out the roles and responsibilities for organisations that have a role in Flood Risk Management (FRM).
- Other environmental legislation such as the **Habitats Directive (1992)**, **Environmental Impact Assessment Directive (2014)** and **Strategic Environmental Assessment Directive (2001)** also apply as appropriate to strategic and site-specific developments to guard against environmental damage.

2.3 Key national, regional and local policy documents and strategies

Table 2-2 summarises key national, regional and local flood risk policy and strategy documents and how these apply to development and flood risk. Hyperlinks are provided to external documents.

These documents may:

- Provide useful and specific local information to inform Flood Risk Assessments within the local area.
- Set the strategic policy and direction for Flood Risk Management (FRM) and drainage – they may contain policies and action plans that set out what future flood mitigation and climate change adaptation plans may affect a development site. A developer should seek to contribute in all instances to the strategic vision for FRM and drainage in the District.
- Provide guidance and/or standards that informs how a developer should assess flood risk and/or design flood mitigation and SuDS.

Table 2-2: National, regional and local key flood risk policy and strategy documents

	Document, lead author and date	Relevant direct legislation	Information	Policy and measures	Development design requirements	Next update due
National	**National Flood and Coastal Erosion Management Strategy** (Environment Agency) 2020	FWMA (Section 2.2.2)	No	Yes	No	2026
	Natural Flood Management Plans (Environment Agency)	N/A	Yes	No	No	-
	National Planning Policy Framework (MHCLG) 2023	Planning and Compulsory Purchase Act 2004 as amended & The Town and Country Planning (Local Planning) (England) Regulations 2012 as amended	No	Yes	Yes	-
	Planning Practice Guidance (MHCLG) 2022		No	Yes	Yes	-
Regional	**South East River Basin Management Plan** (Environment Agency) 2022	WFD (Section 2.2.3)	No	Yes	No	
	South East River Basin District Flood Risk Management Plan (Environment Agency) 2022	Flood Risk Regulations (Section 2.2.1)	No	Yes	No	
	Water, People, Places: A guide for master planning sustainable drainage into developments (South East LLFAs) 2013	N/A	No	No	Yes	-
	Rother and Romney/Cuckmere and Sussex Havens/Medway Catchment Flood Management Plans (Environment Agency) 2009	N/A	Yes	Yes	No	-
	South Foreland to Beachy Head Shoreline Management Plan (Environment Agency) 2006	N/A	No	Yes	No	-

	Document, lead author and date	Relevant direct legislation	Information	Policy and measures	Development design requirements	Next update due
	Folkestone to Cliff End Flood and Erosion Risk Management Strategy, Cooden to Cliff End Coastal Defence Strategy, The Regional Beach Management Plan: Eastbourne to Rye (Environment Agency) 2021/2004/2015	N/A	No	Yes	No	-
	Climate Change guidance for development and flood risk (Environment Agency) 2022	N/A	No	No	Yes	
Local	**Drainage and Wastewater Management Plan** (Southern Water) 2023	N/A	Yes	Yes	Yes	
	Local Flood Risk Management Strategy (ESCC) 2016	FWMA (Section 2.2.2)	Yes	No	No	2026
	Guide to sustainable Drainage Systems (ESCC) 2015	N/A	Yes	No	Yes	-
	Rye/Bexhill/Battle Surface Water Management Plans (ESCC) 2015/2016/2015	N/A	No	Yes	No	-

2.3.1 The National Flood and Coastal Erosion Risk Management Strategy for England (2020)

The **National Flood and Coastal Erosion Risk Management Strategy** (FCERM) for England provides the overarching framework for future action by all risk management authorities to tackle flooding and coastal erosion in England. The new Strategy has been in preparation since 2018. The Environment Agency brought together a wide range of stakeholders to develop the strategy collaboratively. The Strategy is much more ambitious than the previous one from 2011 and looks ahead to 2100 and the action needed to address the challenge of climate change.

The Strategy has been split into 3 high level ambitions: climate resilient places, today's growth and infrastructure resilient in tomorrow's climate and a nation ready to respond and adapt to flooding and coastal change. Measures include updating the national river, coastal and surface water flood risk mapping and the understanding of long term investment needs for flood and coastal infrastructure, trialling new and innovative funding models, flood resilience pilot studies, developing an adaptive approach to the impacts of climate change, seeking nature based solutions towards flooding and erosion issues, integrating natural flood management into the new Environmental Land Management scheme, considering long term adaptive approaches in Local Plans, maximising the opportunities for flood and coastal resilience as part of contributing to environmental net gain for development proposals, investing in flood risk infrastructure that supports sustainable growth, aligning long term strategic planning cycles for flood and coastal work between stakeholders, mainstreaming property flood resilience measures and 'building back better' after flooding, consistent approaches to asset management and record keeping, updating guidance on managing high risk reservoirs in light of climate change, critical infrastructure resilience, education, skills and capacity building, research, innovation and sharing of best practise, supporting communities to plan for flood events, develop world leading ways of reducing the carbon and environmental impact from the construction and operation of flood and coastal defences, development of digital tools to communicate flood risk and transforming the flood warning service and increasing flood response and recovery support.

The Strategy was laid before parliament in July 2020 for formal adoption and published alongside a New **National Policy Statement for Flood and Coastal Erosion Risk Management**. The statement sets out five key commitments which will accelerate progress to better protect and better prepare the country for the coming years:

1. Upgrading and expanding flood defences and infrastructure across the country,
2. Managing the flow of water to both reduce flood risk and manage drought,
3. Harnessing the power of nature to not only reduce flood risk, but deliver benefits for the environment, nature, and communities,
4. Better preparing communities for when flooding and erosion does occur, and
5. Ensuring every area of England has a comprehensive local plan for dealing with flooding and coastal erosion.

2.3.2 Natural Flood Management (NFM) Plans

The Environment Agency has developed **Natural Flood Management (NFM) mapping** which displays opportunities for NFM. These maps are to be used as a guide and supplemented with local knowledge to provide a starting point for discussions about NFM. NFM aims to protect, restore and emulate the natural functions of catchments, floodplains, rivers and the coast. NFM should be used on a catchment wide scale and is the linking of blue and green infrastructure.

The maps identify NFM opportunities on different catchment scales:

- National River Basin Districts
- River Basin Districts showing Management Catchments
- Management Catchments showing Water Body Catchments
- Water Body Catchments.

These catchments cross boundaries between the Rother Local Plan area and other neighbouring authorities. Mapping of the Spatial prioritisation of catchments suitable for using Natural Flood Management can be found on the **Defra data services portal**. Discussions about NFM should be had with catchment stakeholders in combination with local knowledge.

2.3.3 River Basin Management Plans

River Basin Management Plans (RBMPs) are prepared under the Water Framework Directive (WFD) and assess the pressure facing the water environment in River Basin Districts. The Rother Local Plan area falls within the **South East River Basin District RBMP** (2015).

The plan provides a summary of programmes of measures that help prevent deterioration to protect and improve the beneficial use of the water environment in the river basin district. An assessment of whether deterioration has occurred from the 2015 classification baseline was carried out in 2021. Water bodies that deteriorated in ecological status compared to 2015 are identified on the **catchment data explorer** for the south east region. Additional information is provided in the **River basin planning progress report**.

Measures are presented for each significant water management issue in the river basin district which are:

- Physical modifications
- Managing pollution from wastewater
- Managing pollution from towns, cities and transport
- Changes to natural flow and levels of water
- Managing invasive non-native species
- Managing pollution from rural areas

2.3.4 Flood Risk Management Plans

Flood Risk Management Plans (FRMPs) are part of the six-year cycle of assessment, mapping and planning required under the Flood Risk Regulations. Under the Regulations, it is a requirement for the Environment Agency to prepare and publish a Flood Risk Management Plan (FRMP) for risk from rivers, reservoirs and the sea. The FRMP process adopts the same catchments as used in the preparation of River Basin Management Plans, in accordance with the Water Framework Directive.

Accordingly, more detailed strategic information on proposed strategic measures and approaches can be found in the **South East River Basin District Flood Risk Management Plan** (FRMP) (2022) – Part B . The FRMP draws on previous policies and actions identified in the Catchment Flood Management Plans (see section 2.3.6) and also incorporates information from Local Flood Risk Management Strategies (see section 2.3.9).

2.3.5 Water, People, Places: A guide for master planning sustainable drainage into developments (2013)

The Water, People, Places: A guide for master planning sustainable drainage into developments document was prepared by East Sussex County Council and other partner LLFAs across the South East of England. The document outlines consistent guidance, aimed at developers and planners, on how to integrate SuDS into the master planning of small and large developments across the South East of England. The guidance should be referred to as part of the initial planning and design process for all types of residential, commercial and industrial development within the regional area.

2.3.6 Catchment Flood Management Plans

Catchment Flood Management Plans (CFMPs) are high-level strategic plans providing an overview of flood risk across each river catchment. The Environment Agency use CFMPs to work with other key-decision makers to identify and agree long-term policies for sustainable flood risk management.

There are six pre-defined national policies provided in the CFMP guidance and these are applied to specific locations through the identification of 'Policy Units'. These policies are intended to cover the full range of long-term flood risk management options that can be applied to different locations in the catchment.

The six national policies are:

- No active intervention (including flood warning and maintenance). Continue to monitor and advise
- Reducing existing flood risk management actions (accepting that flood risk will increase over time)
- Continue with existing or alternative actions to manage flood risk at the current level (accepting that flood risk will increase over time from this baseline)
- Take further action to sustain the current level of flood risk (responding to the potential increases in risk from urban development, land use change and climate change)
- Take action to reduce flood risk (now and/or in the future)
- Take action with others to store water or manage run-off in locations that provide overall flood risk reduction or environmental benefits, locally or elsewhere in the catchment.

Rother District sits within the **Rother and Romney CFMP** and the **Cuckmere and Sussex Havens CFMP**. A very small area in the north of the District is also covered by the **Medway CFMP**.

Rother and Romney Catchment Flood Management Plan (2009)

The Local Plan area is partially covered by the **Rother and Romney Catchment Flood Management Plan**. The primary policy units that cover the area are:

- **Policy 3 – Etchingham and Robertsbridge/ Romney and Walland Marshes.** Areas of low to moderate flood risk where existing risk is generally being managed effectively
- **Policy 4 – Rye.** Areas low, moderate or high flood risk where existing risk is generally being managed effectively but further actions may be needed due to climate change

- **Policy 6 – Rural Rother.** Areas of low to moderate flood risk where other people and groups will be worked with to manage landscapes in locations that provide overall flood risk reductions or environmental benefits

Cuckmere and Sussex Havens Catchment Flood Management Plan (2009)

The Local Plan area is also partially covered by the **Cuckmere and Sussex Havens Catchment Flood Management Plan**. The primary policy units that cover the area are:

- **Policy 4 –Bexhill, Hastings Bulverhythe and St Leonards/Crowhurst.** Areas low, moderate or high flood risk where existing risk is generally being managed effectively but further actions may be needed due to climate change
- **Policy 6 – High and Low Weald and The Levels.** Areas of low to moderate flood risk where other people and groups will be worked with to manage landscapes in locations that provide overall flood risk reductions or environmental benefits.

Medway Catchment Flood Management Plan (2004)

The **Medway Catchment Flood Management Plan** covers the northern part of the Ticehurst Parish only. The policy unit for this area is:

- **Policy 6 – Upstream of Tonbridge.** Areas of low to moderate flood risk where other people and groups will be worked with to manage landscapes in locations that provide overall flood risk reductions or environmental benefits

2.3.7 Shoreline Management Plans

Shoreline Management Plans (SMP) form part of Defra's strategy for flood and coastal defence. They provide a large-scale assessment of risks associated with coastal evolution and present the policy framework to address these risks in a sustainable manner. The SMP policies defined by DEFRA are:

- **Hold the line** – maintain or upgrade the level of protection provided by defences.
- **Advance the line** – build new defences seaward of the existing defence line.
- **Managed realignment** – allowing retreat of the shoreline, with management to control or limit the movement.
- **No active intervention** – a decision not to invest in providing or maintaining defences.

Not all policies are guaranteed funding and over time the Environment Agency along with other partners will identify the cost. The SMPs are currently undergoing a refresh.

The **South Foreland to Beachy Head Shoreline Management Plan** covers the length of the coastline in the Rother Local Plan area. It was published in April 2006 following a review of the original SMP produced in 1996. The long-term policy for the coastline within Rother District Council's administrative area is to 'Hold the Line' or allow for 'Managed Realignment'. However, a 'No active intervention' approach will be taken between Cliff End and Fairlight Cove and at Fairlight Cove West in order to allow ongoing natural erosions of the cliffs to maintain the geological value of the frontage and act as a source of beach material to the shoreline.

The **Shoreline Management Plan** explorer can be used to study the policies in more detail.

2.3.8 Coastal Defence Strategies

Folkestone to Cliff End Flood and Erosion Risk Management Strategy (2021)

The **Folkestone to Cliff End Flood and Erosion Risk Management Strategy** sets out plans to manage flood and erosion risks along the coastline of Romney Marsh. The strategy details improvements to be made to existing defences to reduce flood risk to Romney Marsh to a 0.5% chance in any year for a 100-year period, accounting for climate change. The strategy identified a number of individual schemes within the Rother District administrative area including the Pett Level coastal defence scheme (completed in 2007), the Rother Tidal Walls West (completed in 2006), Broomhill Sands coastal defences (completed in 2015) and the Rother Tidal Walls East and Lydd Ranges (business cases currently being developed).

Cooden to Cliff End Coastal Defence Strategy (2004)

The **Cooden to Cliff End Coastal Defence Strategy** considers 19km of shoreline between Cooden and Cliff End in East Sussex, including Bexhill, Bulverhythe and Fairlight within the Local Plan area. The strategy justifies the preferred policies set out in the Shoreline Management Plan (see section 2.3.7) and details the planned works and management approaches that should be used to achieve namely the 'Hold the Line' and the 'Managed Realignment' policies, except Fairlight where the policy is 'No Active Intervention'.

The Regional Beach Management Plan: Eastbourne to Rye (2015)

The Regional Beach Management Plan: Eastbourne to Rye sets out approaches for intervention and monitoring to maintain the beach where it provides an integral part of sea defences between Eastbourne and the River Rother. The plan covers Local Plan areas including Bexhill, Fairlight and Winchelsea Beach.

2.3.9 East Sussex Local Flood Risk Management Strategy

The **East Sussex Local Flood Risk Management Strategy** was published in 2016. The Strategy sets out how East Sussex County Council will manage local flood risk i.e. from surface water runoff, groundwater and ordinary watercourses, for which they have a responsibility as LLFA and the work that other Risk Management Authorities are doing to manage flood risk in the County.

The Strategy has five objectives, which are to:

1. Establish and maintain effective partnership with key organisations and local communities in order to develop collective knowledge, share best practice and secure funding for local flood risk management measures
2. Improve the evidence base and understanding of local flood risk to ensure that limited resources are targeted in the areas of highest risk and vulnerability
3. Empower local communities and landowners to take action in order to be prepared for and limit the impacts of flooding
4. Avoid increasing flood and coastal erosion risk by encouraging best practice for the maintenance of assets and preventing inappropriate development
5. Work in partnership to deliver cost-effective flood and coastal erosion risk management measures which take a catchment wide approach and contribute to wider social, economic and environmental benefits

The Delivery Plan (2020-2023) sets out the key actions to be progressed by risk management authorities and key partners in order to work towards achieving these objectives. The Delivery Plan is reviewed on an annual basis.

Prioritised actions set out in the Local FRM Strategy include:

- Investigating flood incidents
- Collating data on flood risk assets
- Designating third party assets affecting flood risk
- Responding to planning applications
- Working with others to develop flood risk schemes
- Taking land drainage enforcement action

The Strategy notes that the Council will seek to deliver sustainable drainage systems (SuDS) as part of new development in its role as statutory consultee for major planning applications and non-statutory consultee for non-major planning applications.

2.3.10 Guide to Sustainable Drainage Systems in East Sussex (2015)

East Sussex County Council encourages all developments to use Sustainable Drainage Systems (SuDS) to manage flood risk and improve water quality, the local environment and wildlife habitats. East Sussex County Council in partnership with other South East LLFAs has produced a **Guide to Sustainable Drainage Systems in East Sussex**. The guide sets out the framework for integrating SuDS into development layouts. It explains in more detail what SuDS are, their benefits and the process of designing and implementing them within the East Sussex environment. More information on this is provided in Section 9.

2.3.11 Surface Water Management Plans

Surface Water Management Plans (SWMPs) outline the preferred surface water management strategy in a given location. SWMPs are undertaken by LLFAs in consultation with key local partners who are responsible for surface water management and drainage in their area. SWMPs establish a long-term action plan to manage surface water in a particular area and are intended to influence future capital investment, drainage maintenance, public engagement and understanding, land-use planning, emergency planning and future developments.

Three Surface Water Management Plans (SWMPs) have been completed within the Local Plan area, the **Battle Surface Water Management Plan** (2015), **Bexhill Surface Water Management Plan** (2016) and **Rye Surface Water Management Plan** (2015). The plans were developed as part of a commission by ESCC, which involved producing SWMPs for twelve areas with a significant history of flooding in East Sussex. The plans identify priority areas at risk of flooding, summarising the causes and impacts associated with flood events. The plans then outline three potential action plans for managing the identified flood risks, a generic action plan relevant to the entire area, a priority area action plan relevant to the identified priority areas and the incident specific action plan relating to individual flood incidents reported. The actions identified include short-term approaches and 'quick wins', as well as longer term approaches requiring monitoring and maintenance.

The SWMPs have identified some at risk development sites (based on the data available when the SWMPs were put together). It is recommended that planning authorities incorporate these findings into site allocations and that any issues are raised to developers, to allow for pre-emptive flood risk reduction during the planning process.

2.3.12 Drainage and Wastewater Management Plan (DWMP) for the Rother River Basin Catchment

Water and Sewer companies must produce Drainage Water Management Plans (DWMPs), looking at current and future capacity, pressures and risks to their

networks such as climate change and population growth. The companies must detail how they will manage these pressures and risks, and how they will work with other risk management authorities or drainage asset owners.

Southern Water have developed their DWMP for the Rother River Basin Catchment (2023). The Baseline Risk and Vulnerability Assessment (BRAVA) was undertaken as part of the DWMP, to identify current system performance and future vulnerabilities. This assessment was completed for each of the wastewater systems in the Rother Catchment. The output of the BRAVA shows:

- The current risks and issues in each wastewater systems in the Rother Catchment
- The future risks in 2030, 2035, 2045 and 2050, to understand how the current risks may change without additional investment
- The key issues behind the future changes in risk

3 Planning policy for flood risk management

This section summarises national planning policy for development and flood risk.

3.1 National Planning Policy Framework and Guidance

The **revised National Planning Policy Framework** (NPPF) was published in July 2021 (and subsequently amended in December 2023), replacing the previous versions published in July 2018 and March 2012. The NPPF sets out Government's planning policies for England. It must be taken into account in the preparation of local plans and is a material consideration in planning decisions. The NPPF defines Flood Zones, how these should be used to allocate land and flood risk assessment requirements. The NPPF states that:

"Strategic policies should be informed by a strategic flood risk assessment and should manage flood risk from all sources. They should consider cumulative impacts in, or affecting, local areas susceptible to flooding, and take account of advice from the Environment Agency and other relevant flood risk management authorities, such as lead local flood authorities and internal drainage boards" – NPPF Paragraph 166

National Planning Practice Guidance (PPG) on flood risk was published in March 2014 (and has since been revised / updated) and sets out how the policy should be implemented. **Diagram 1 in the PPG** sets out how flood risk should be considered in the preparation of strategic policies.

3.2 The risk-based approach

The NPPF takes a risk-based approach to development in flood risk areas.

3.2.1 The Flood Zones

The Flood Zones are:

- Flood Zone 1: Low probability: land having less than 0.1% annual probability of river and sea flooding.
- Flood Zone 2: Medium probability: land having between a 1% and 0.1% annual probability of river flooding; or between 0.5% and 0.1%annual probability of sea flooding.
- Flood Zone 3a: High probability: land having 1% or greater annual probability of river flooding; or land having a 0.5% or greater annual probability of sea flooding. Excludes Flood Zone 3b.
- Flood Zone 3b: Functional Floodplain: land where water has to flow or be stored in times of flood. SFRAs identify this Flood Zone in discussion with the LPA and the Environment Agency. The identification of functional floodplain takes account of local circumstances and not be defined solely on rigid probability parameters. Only water compatible and essential infrastructure are permitted in this zone and should be designed to remain operational in times of flood, resulting in no loss of floodplain or blocking of water flow routes. Functional floodplain will normally comprise of:
    - Land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or

- Land that is designed to flood (such as flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding).

Excluding Flood Zone 3b, the Flood Zones do not take into account the presence of defences. This is interpreted to mean that flooding is not constrained by formal raised flood defences, therefore the Flood Zones ignore the effect of defences in reducing the probability of flooding but do not underestimate the extents of flooding where defences increase the area potentially at risk. This is important for planning long term developments as long-term policy and funding for maintaining flood defences over the lifetime of a development may change over time.

They also do not take into account surface water, sewer or groundwater flooding or the impacts of canal or reservoir failure or climate change. Hence there could still be a risk of flooding from other sources and the level of flood risk will change over time during the lifetime of a development.

3.2.2 The Sequential Test

Firstly, land at the lowest risk of flooding and from all sources should be considered for development. A test is applied called the 'Sequential Test' to do this. Figure 3-1 summarises the Sequential Test. The LPA will apply the Sequential Test to strategic allocations. For all other developments in Flood Zones 2 and 3 (or in Flood Zone 1 on land with other flooding/drainage issues), developers must supply evidence to the LPA, with a Planning Application, that the development has passed the test.

The LPA should work with the Environment Agency to define a suitable area of search for the consideration of alternative sites in the Sequential Test. A local planning authority should demonstrate through evidence that it has considered a range of options in the site allocation process, using the Strategic Flood Risk Assessment to apply the Sequential Test and the Exception Test where necessary. This can be undertaken directly or, ideally, as part of the sustainability appraisal. Where other sustainability criteria outweigh flood risk issues, the decision-making process should be transparent with reasoned justifications for any decision to allocate land in areas at high flood risk in the sustainability appraisal report. The Sequential Test can also be demonstrated in a free-standing document, or as part of the Housing and Economic Land Availability Assessment (HELAA).

Whether any further work is needed to decide if the land is suitable for development will depend on both the vulnerability of the development and the Flood Zone it is proposed for. **Table 2 of the PPG** shows whether, having applied the Sequential Test first, the vulnerability of development is compatible with a particular Flood Zone and where the exception test is required to determine the suitability of development.

Rother District Council require that developments in areas at risk of surface water, groundwater or reservoir flooding will be expected to follow the same requirements as those laid out in Parts (a) and (b) of the NPPF's Exception Test.

Figure 3-1: The Sequential Test

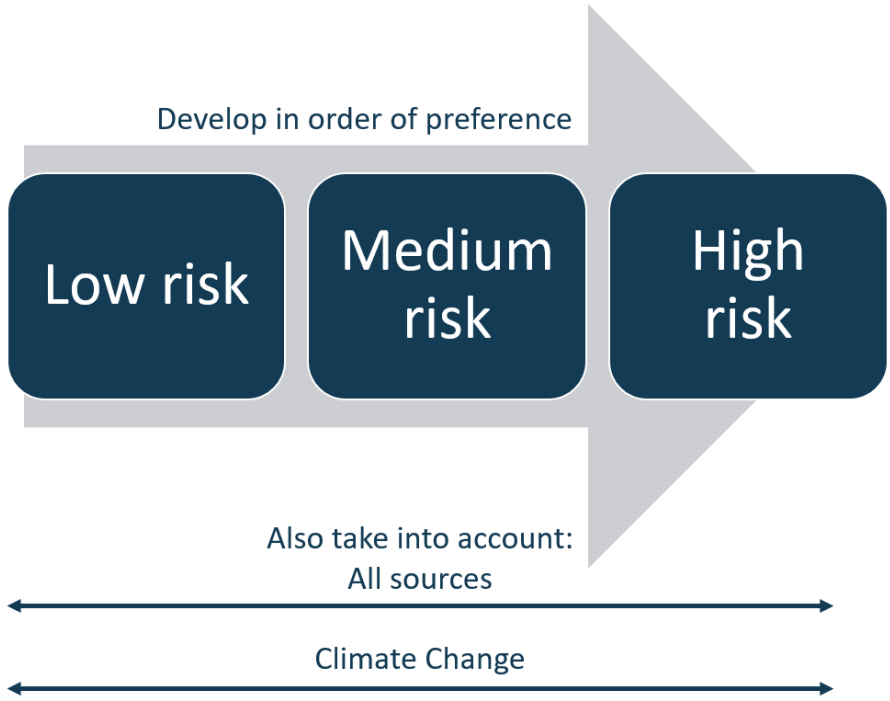
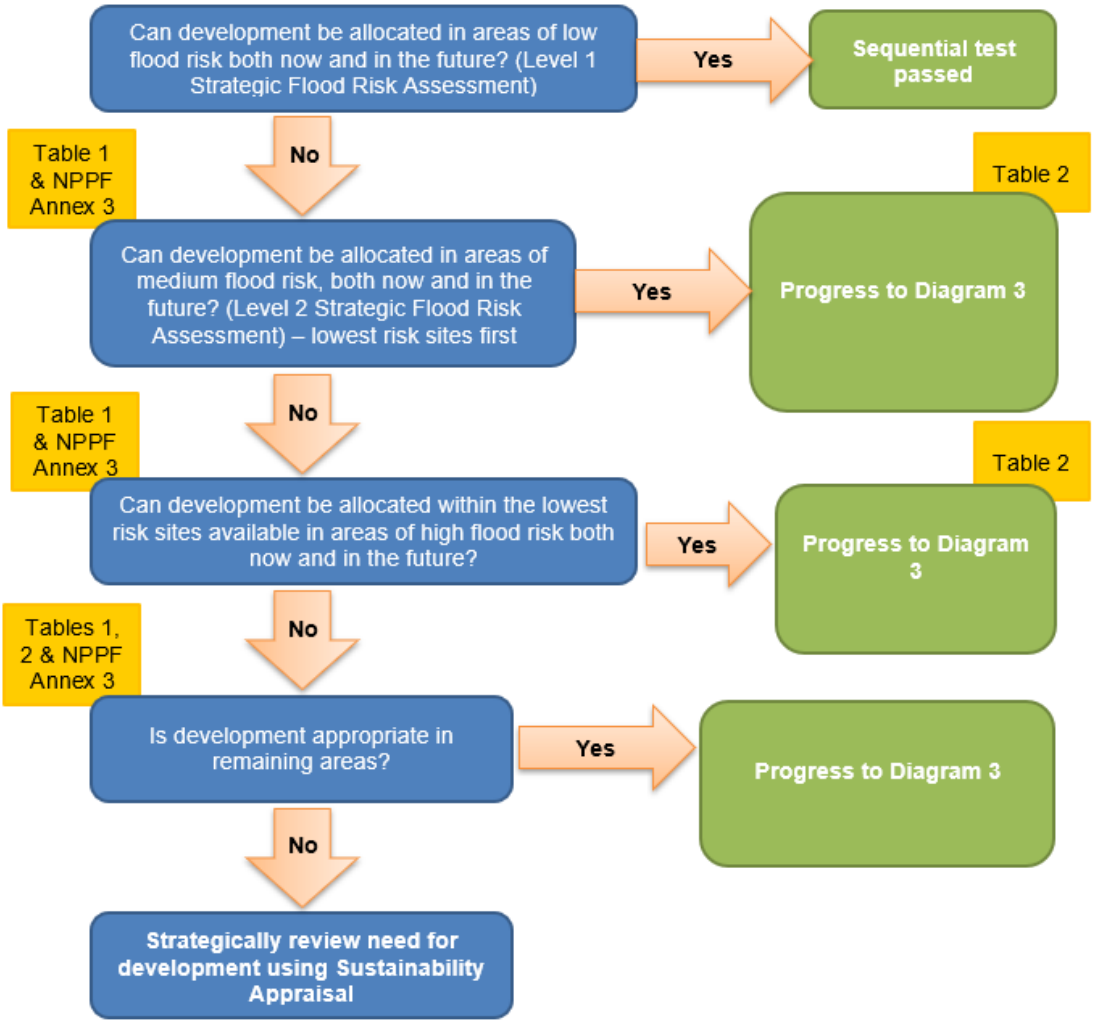


Figure 3-2 illustrates the Sequential and Exception Tests as a process flow diagram using the information contained in this SFRA to assess potential development sites against flood zones and development vulnerability compatibilities.

This is a stepwise process, but a challenging one, as a number of the criteria used are qualitative and based on experienced judgement. The process must be documented, and evidence used to support decisions recorded.

In addition, the risk of flooding from other sources and the impact of climate change must be considered when assessing which sites are suitable to allocate. The SFRA Guide to using Technical Data in Appendix O and the Methodology in support of performing the Sequential Test in Appendix 149 shows where the Sequential and Exception Tests may be of concern with the datasets, recommending what development might be appropriate in what situations.

Figure 3-2: Local Plan sequential approach to site allocation



3.2.3 The Exception Test

It will not always be possible for all new development to be allocated on land that is not at risk from flooding. To further inform whether land should be allocated, or Planning Permission granted, a greater understanding of the scale and nature of the flood risks is required. In these instances, the Exception Test will be required. **Diagram 3 of the PPG** (Figure 3-3) summarises the Exception Test.

The Exception Test should only be applied following the application of the Sequential Test. It applies in the following instances:

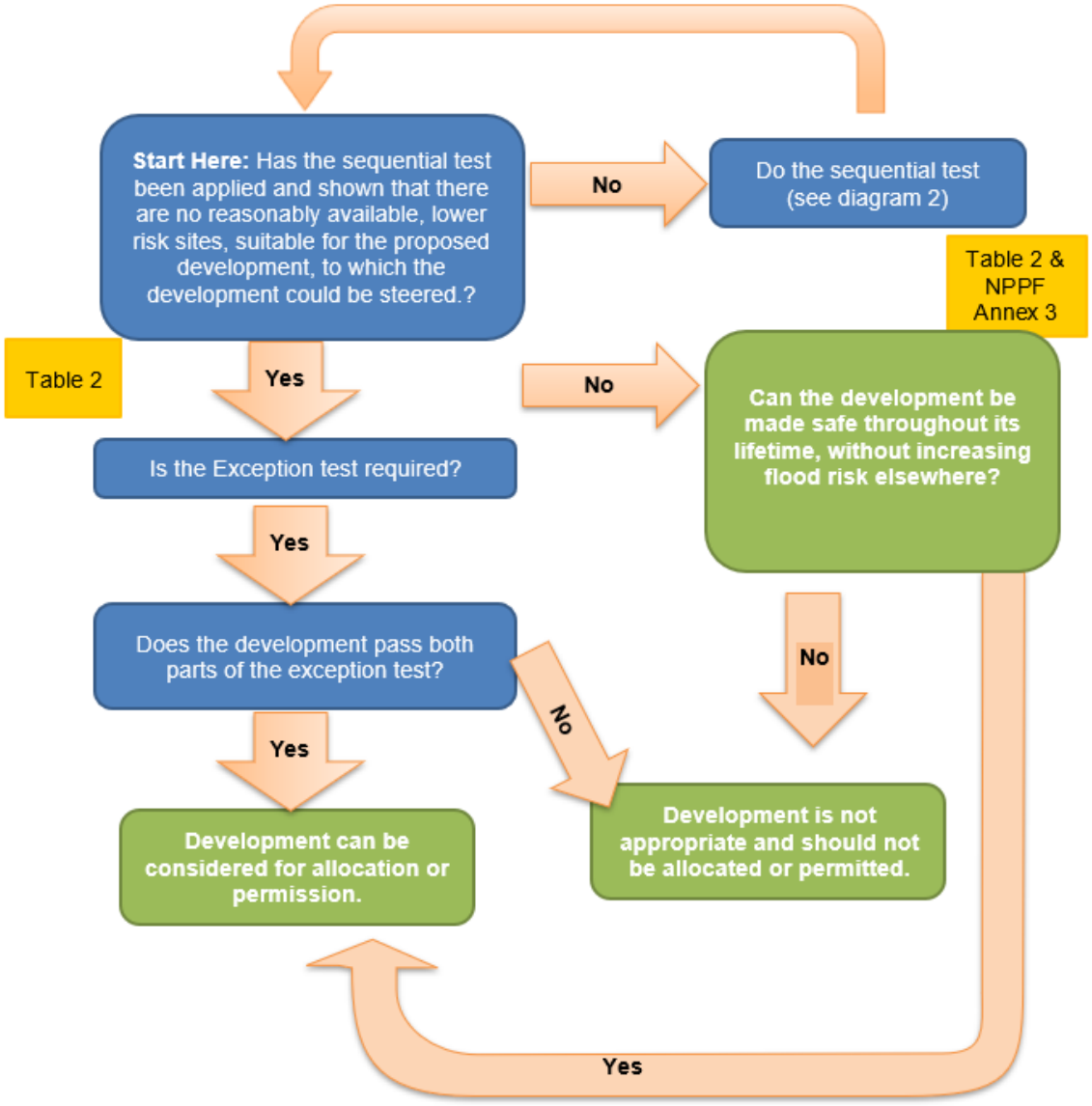
- More vulnerable in Flood Zone 3a
- Essential infrastructure in Flood Zone 3a or 3b
- Highly vulnerable in Flood Zone 2 (this is NOT permitted in Flood Zone 3a or 3b)

An LPA should apply the Exception Test to strategic allocations. For all developments, developers must supply evidence to the LPA, with a Planning Application, that the development has passed the test. This is because when a site-

specific Flood Risk Assessment is done, more information on the exact measures that can manage the risk is available.

Rother District Council require that developments in areas at risk of surface water, groundwater or reservoir flooding will be expected to follow the same requirements as those laid out in Parts (a) and (b) of the NPPF's Exception Test.

Figure 3-3: The Exception Test



There are two parts to demonstrating a development passes the Exception Test:

1. *Demonstrating that the development would provide wider sustainability benefits to the community that outweigh the flood risk*

   Local planning authorities will need to consider what criteria they will use to assess whether this part of the Exception Test has been satisfied and give advice to enable applicants to provide evidence to demonstrate that it has been

passed. If the application fails to prove this, the Local Planning Authority should consider whether the use of planning conditions and / or planning obligations could allow it to pass. If this is not possible, this part of the Exception Test has not been passed and planning permission should be refused.

2. *Demonstrating that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.*

A Level 2 SFRA is likely to be needed to inform the Exception Test in these circumstances for strategic allocations. At Planning Application stage, a site-specific Flood Risk assessment will be needed. Both would need to consider the actual and residual risk and how this will be managed over the lifetime of the development.

3.3 Applying the Sequential Test and Exception Test to individual planning applications

3.3.1 Sequential Test

Rother District Council are responsible for considering the extent to which Sequential Test considerations have been satisfied. The Environment Agency and Lead Local Flood Authority may be invited by Rother District Council to provide comment in respect of the accuracy of the data the test is based on.

Developers are required to apply the Sequential Test to all development sites, unless the site is:

- a strategic allocation and the test has already been carried out by the LPA at the plan making stage
- a change of use (except to a more vulnerable use)
- a minor development (householder development, small non-residential extensions with a footprint of less than 250m^2); or
- a development in flood zone 1 unless there are other flooding issues in the area of the development (i.e. surface water, ground water, sewer flooding) or information indicates there may be a risk of flooding in the future.

The SFRA contains information on all sources of flooding and taking into account the impact of climate change. This should be considered when a developer undertakes the Sequential Test, including the consideration of reasonably available sites at lower flood risk.

The following appendices should be referred to when undertaking the Sequential Test:

Appendix A - Historic flooding

Appendix C - Fluvial and Tidal Flood Zones

Appendix D - Fluvial and tidal climate change flood risk map

Appendix F - Surface water flood risk map

Appendix G - Surface water climate change flood risk map

Appendix H - JBA Groundwater Flood Map

Appendix I - Reservoir inundation map

Guidance on how to use these datasets within the Sequential Test can be found in Appendix 149.

Local circumstances must be used to define the area of application of the Sequential Test (within which it is appropriate to identify reasonably available alternatives). The criteria used to determine the appropriate search area relate to the catchment area for the type of development being proposed. For some sites this may be clear e.g. school catchments, in other cases it may be identified by other Local Plan policies. For some sites e.g. regional distribution sites, it may be suitable to widen the search area beyond LPA administrative boundaries.

The sources of information on reasonably available sites may include:

- Site allocations in Local Plans
- Site with Planning Permission but not yet built out
- Strategic Housing and Economic Land Availability Assessments (SHELAAs)/ five-year land supply/ annual monitoring reports
- Locally listed sites for sale.

It may be that a number of smaller sites or part of a larger site at lower flood risk form a suitable alternative to a development site at high flood risk.

Ownership or landowner agreement in itself is not acceptable as a reason not to consider alternatives.

The SFRA guide to using technical data in Appendix O shows where the Sequential and Exception Test may be required for the datasets assessed in the SFRA, and how to interpret different levels of concern with the datasets, recommending what development might be appropriate in what situations.

3.3.2 The Exception Test

If, following application of the Sequential Test it is not possible for the development to be located in areas with a lower probability of flooding the Exception Test must then be applied if required (as set out in **Table 2** of the PPG). Developers are required to apply the Exception Test to all applicable sites (including strategic allocations).

Rother District Council require that developments in areas at risk of surface water, groundwater or reservoir flooding will be expected to follow the same requirements as those laid out in Parts (a) and (b) of the NPPF's Exception Test.

The applicant will need to provide information that the application can pass both parts of the Exception test:

- *Demonstrating that the development would provide wider sustainability benefits to the community that outweigh the flood risk*

  Applicants should refer to wider sustainability objectives in Local Plan Sustainability Appraisals. These generally consider matters such as biodiversity, green infrastructure, historic environment, climate change adaptation, flood risk, green energy, pollution, health, transport etc.

  Applicants should detail the sustainability issues the development will address and how these will outweigh the flood risk concerns for the site e.g. by facilitating wider regeneration of an area, providing community facilities, infrastructure that benefits the wider area etc.

- *Demonstrating that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.*

  The site-specific Flood Risk Assessment should demonstrate that the site will be safe, and the people will not be exposed to hazardous flooding from

any source. The FRA should consider actual and residual risk and how this will be managed over the lifetime of the development, including:

- the design of any flood defence infrastructure;
- access and egress;
- operation and maintenance;
- design of the development to manage and reduce flood risk wherever possible;
- resident awareness;
- flood warning and evacuation procedures, including whether the developer would increase the pressure on emergency services to rescue people during a flood event; and
- any funding arrangements required for implementing measures.

Developers should refer to site Specific Flood Risk Assessments to identify opportunities to reduce flood risk as part of development. Reduction in flood risk could be achieved by:

- incorporating green infrastructure within the layout to make additional space or storage of flood water;
- providing Sustainable Drainage Systems that manage flood risk beyond the proposed site and above the usual standard, such as removing surface water from existing combined sewers;
- providing or making contributions to flood risk management infrastructure that will provide additional benefits to existing communities and/or by safeguarding the land that would be needed to deliver it

As stated in **Paragraph 031 of the PPG** (Flood and Coastal Change), the Exception Test is not a tool to justify development in flood risk areas when the Sequential Test has already shown that there are reasonably available, lower risk sites, appropriate for the proposed development. It would only be appropriate to move onto the Exception Test in these cases where, accounting for wider sustainable development objectives, application of relevant local and national policies would provide a clear reason for refusing development in any alternative locations identified.

3.3.3 Cross-boundary considerations

Situations may occur where a development site is situated across Local Authority boundaries, or where the development in one district or borough may impact flood risk elsewhere. Rother District Council should consider the impacts of development on flood risk elsewhere even if the impact of this is not within their area. In situations where cross-boundary developments are proposed, Rother should work closely with other Local Planning Authorities to satisfy the requirements of policies in their respective Local Plans, in consultation with statutory consultees such as the Environment Agency and Lead Local Flood Authority.

4 Climate change

The NPPF sets out that flood risk should be managed over the lifetime of a development, taking climate change into account. This section sets out how the impact of climate change should be considered. Refer to the SFRA guide to using technical data in Appendix O for recommendations and details on how to apply the Sequential and Exception tests using the data set out in this section.

4.1 Climate change and the NPPF

The updated NPPF (July 2021, amended December 2023) sets out how the planning system should help minimise vulnerability and provide resilience to the impacts of climate change. The NPPF and PPG describe how FRAs should demonstrate how flood risk will be managed over the lifetime of the development, taking climate change into account.

The NPPF also states that the 'sequential approach should be used in areas known to be at risk now or in the future from any form of flooding' (**para 168**).

4.2 Revised climate change guidance

The Environment Agency guidance **Flood risk assessment: climate change allowances** was last updated in May 2022. This supports the NPPF and must be considered in all new developments and planning applications. The document contains guidance on how climate change should be accounted for when considering development, specifically how allowances for climate change should be included within Strategic Flood Risk Assessments and site-specific Flood Risk Assessments. The Environment Agency can give a free preliminary opinion to applicants on their proposals at pre-application stage. There is a charge for more detailed pre-application planning advice.

4.3 Climate change allowances

By making an allowance for climate change it will help reduce the vulnerability of the development and provide resilience to flooding in the future.

The climate change guidance includes climate change predictions of anticipated change for peak river flow, peak rainfall intensity and sea level rise. These allowances are based on climate change projections and different scenarios of carbon dioxide emissions to the atmosphere.

Due to the complexity of projecting the effects of climate change, there are uncertainties attributed to climate change allowances. As a result, the guidance presents a range of possibilities to reflect the potential variation in the impact of climate change over three periods.

The UK Climate Predictions 2018 (UKCP18) were published on 26 November 2018. The UKCP18 projections replace the UKCP09 projections and are the official source of information on how the climate of the UK may change over the rest of this century. Climate change allowances for peak river flow, peak rainfall intensity and sea level rise have been updated to take account of the UKCP18 projections.

For the purposes of the 2024 Level 1 SFRA the updated allowances have been considered. Section 5.3.1 details the climate change modelling used for the study and where applicable the model where climate change allowances were updated for the study. If a Level 2 SFRA is required, any further changes to the climate change allowances will be considered at that stage.

4.4 Peak river flows

Climate change is expected to increase the frequency, extent and impact of flooding, reflected in peak river flows. Wetter winters and more intense rainfall may increase fluvial flooding and surface water runoff and there may be increased storm intensity in summer. Rising river levels may also increase flood risk.

The peak river flow allowances provided in the guidance show the anticipated changes to peak flow for the river basin district within which a watercourse is located. Once the river basin district has been identified, guidance on uplift in peak flows are provided for three allowance categories, Central, Higher Central and Upper End which are based on the 50th, 70th and 95th percentiles respectively. The allowance category to be used is based on the vulnerability classification of the development and the Flood Zones within which it is located (Table 4-4,Table 4-5).

These allowances (increases) are provided, in the form of figures for the total potential change anticipated, for three climate change epochs:

- The '2020s' (2015 to 2039)
- The '2050s' (2040 to 2069)
- The '2080s' (2070 to 2115)

The time period used in the assessment depends upon the expected lifetime of the proposed development. Residential development should be considered for a minimum of 100 years, whilst the lifetime of a non-residential development depends upon the characteristics of that development but a period of at least 75 years is likely to form a starting point for assessment (**PPG paragraph 006**). Further information on what is considered to be the lifetime of development is provided in the **PPG**.

Land within the Local Plan area is located within the Rother Management Catchment, the Cuckmere and Pevensey Levels Management Catchment and the Medway Management Catchment. Maps showing the extents of the Management Catchments are **published by the Environment Agency**. The allowances for these catchment areas are provided in Table 4-1, Table 4-2 and Table 4-3.

Developers should consult the **climate change allowances** guidance website for details of the most up-to-date allowances.

Table 4-1: Peak river flow allowances for the Rother Management Catchment

Allowance category	Total potential change anticipated for '2020s' (2015 to 39)	Total potential change anticipated for '2050s' (2040 to 2069)	Total potential change anticipated for '2080s' (2070 to 2115)
Upper end	29%	38%	66%
Higher central	19%	23%	38%
Central	15%	16%	28%

Table 4-2: Peak river flow allowances for the Cuckmere and Pevensey Levels Management Catchment

Allowance category	Total potential change anticipated for '2020s' (2015 to 39)	Total potential change anticipated for '2050s' (2040 to 2069)	Total potential change anticipated for '2080s' (2070 to 2115)
Upper end	35%	44%	76%
Higher central	24%	26%	43%
Central	18%	19%	32%

Table 4-3: Peak river flow allowances for the Medway Management Catchment

Allowance category	Total potential change anticipated for '2020s' (2015 to 39)	Total potential change anticipated for '2050s' (2040 to 2069)	Total potential change anticipated for '2080s' (2070 to 2115)
Upper end	29%	37%	62%
Higher central	19%	21%	37%
Central	14%	15%	27%

4.4.1 Which peak river flow allowance to use?

The Flood Zone and flood risk vulnerability classification should be considered when deciding which allowances apply to the development or the plan. Vulnerability classifications are found in the **PPG**. The Environment Agency guidance states that both the central and higher central allowances should be assessed in strategic flood risk assessments. Specific guidance is given for which climate change allowance allowances should be applied to Flood Zone 2 and 3a (Table 4-4) and 3b (Table 4-5). For site specific Flood Risk Assessments, the central allowances should be used in most instances with the exception of 'essential infrastructure' where the guidance is to use the 'higher central' allowance.

Table 4-4: Flood Zone 2 and Flood Zone 3a peak river flow allowance guidance

Vulnerability classification	Central	Higher Central	Upper end
Essential infrastructure		✓	
Highly vulnerable	Development is not permitted in Flood Zone 3a	Development is not permitted in Food Zone 3a	Development is not permitted in Flood Zone 3a
More vulnerable	✓		

Vulnerability classification	Central	Higher Central	Upper end
Less vulnerable	✓		
Water compatible	✓		

Table 4-5: Flood Zone 3b peak river flow allowance guidance

Vulnerability classification	Central	Higher Central	Upper end
Essential infrastructure		✓	
Highly vulnerable	Development not permitted		
More vulnerable			
Less vulnerable			
Water compatible	✓		

Currently there is no guidance on considering the impact of climate change on development located within Flood Zone 1. However it is anticipated that this should follow the guidance set-out in Table 4-4.

4.5 Peak rainfall intensity allowance

Climate change is predicted to result in wetter winters and increased summer storm intensity in the future. This increased rainfall intensity will affect land and urban drainage systems, resulting in surface water flooding, due to the increased volume of water entering the systems. The Environment Agency have developed a peak rainfall allowances map which shows anticipated changes in peak rainfall intensity for which can be used for site-scale applications (like urban drainage design) and surface water flood mapping in small catchments (<5km^2)

The guidance suggests that direct rainfall modelling may not be suited to larger (>5km^2) catchments with rural land use. In these instances, the guidance states that the fluvial flood risk affected by climate change should be assessed using uplifts from peak river flow allowances (Section 4.4).

All rainfall intensity climate change uplifts should be applied to both the 3.3% and 1% AEP events. The recommended central and upper end allowances are based on the design lifetime of the proposed development and are shown in Table 4-6, Table 4-7 and Table 4-8.

According to the Environment Agency's mapped rainfall intensity climate change uplifts, the study area of this SFRA falls within the Rother Management Catchment (Table 4-6), the Cuckmere and Pevensey Levels Management Catchment (Table 4-7) and the Medway Management Catchment (Table 4-8).

Table 4-6: Peak rainfall intensity allowance for the Rother Management Catchment

Epoch	3.3% AEP – central end allowance	3.3% AEP – upper end allowance	1% AEP – central allowance	1% AEP – upper end allowance
2050s	20%	40%	20%	45%
2070s	20%	40%	20%	45%

Table 4-7: Peak rainfall intensity allowance for the Cuckmere and Pevensey Levels Management Catchment

Epoch	3.3% AEP – central end allowance	3.3% AEP – upper end allowance	1% AEP – central allowance	1% AEP – upper end allowance
2050s	20%	40%	20%	45%
2070s	25%	40%	25%	45%

Table 4-8: Peak rainfall intensity allowance for the Medway Management Catchment

Epoch	3.3% AEP – central end allowance	3.3% AEP – upper end allowance	1% AEP – central allowance	1% AEP – upper end allowance
2050s	20%	35%	20%	45%
2070s	20%	35%	20%	40%

Developers should consult the **climate change allowances** guidance website for details of the most up-to-date allowances.

4.5.1 Which peak rainfall intensity allowance to use?

The **PPG** states that all rainfall intensity climate change uplifts should be applied to both the 3.3% and 1% AEP events. The recommended epoch and use of either the central or upper end allowances should be based on the design lifetime of the development. For a development with a lifetime beyond 2100 the Upper end allowance should be used. For development with a shorter lifetime the Central allowance should be used. Further details are provided within the EA **guidance on climate change allowances.**

4.6 Tidal/coastal change

Climate change is predicted to result in higher sea levels caused by melting ice sheets and more extreme storm events which will create higher storm surges.

The **Environment Agency's 2019 sea level allowances** have been used in the preparation of this report as confirmed by the Environment Agency (Table 4-9). These are based on coastal regions and Rother district is within the South East region.

Table 4-9: Peak sea level allowances for the South East

Allowance category	Annual sea level rise allowance 2000 to 2035	Annual sea level rise allowance 2036 to 2065	Annual sea level rise allowance 2066 to 2095	Annual sea level rise allowance 2096 to 2125	Cumulative rise 2000 to 2125
Upper end	6.9mm	11.3mm	15.8mm	18.2mm	1.6m
Higher central	5.7mm	8.7mm	11.6mm	13.1mm	1.2m

High++ allowance (1.9m) may be appropriate in assessments for developments that are very sensitive to flood risk, that have lifetimes beyond the end of the century. H++ estimates represent the upper limit of plausible climate projections. Where applicable the H++ allowance assessment should be carried out as well as assessing sea level rise allowances shown in Table 4-9. The Environment Agency guidance **Flood risk assessment: climate change allowances** states that the H++ allowance should be used for Nationally Significant Infrastructure Projects (NSIPs), new settlements or significant urban extensions. In these instances, the Upper End peak river flow allowance should also be considered where applicable.

4.6.1 Which sea level allowance to use?

To help decide which allowances should be selected to inform the flood levels in flood risk assessments and management strategies for a development or development plan allocation, the following should be considered:

- likely depth, speed and extent of flooding for each allowance of climate change over time considering the allowances for the relevant epoch (2020s, 2050s and 2080s)
- vulnerability of the proposed development types or land use allocations to flooding
- 'built in' resilience measures used, for example, raised floor levels
- capacity or space in the development to include additional resilience measures in the future, using a 'managed adaptive' approach

4.7 Groundwater

The effect of climate change on groundwater flooding problems, and those watercourses where groundwater has a large influence on winter flood flows, is much more uncertain. Milder wetter winters may increase the frequency of groundwater flooding incidents in areas that are already susceptible, but warmer drier summers may counteract this effect by drawing down groundwater levels to a greater extent during the summer months. The effect of climate change on groundwater levels for sites in areas where groundwater is known to be an issue should be considered at the planning application stage.

4.8 The impact of climate change in the study area

The **UKCP18** provides a number of future projections for different variables across the UK.

South East England

- Increased mean summer temperatures of over 8ºC by 2099.
- Increased mean winter temperatures of up to 7ºC or a decrease of up to 1ºC by 2099.
- Summer rainfall could decrease by over 80% or it could increase up to 10% by 2099.
- Winter rainfall could decrease by up to 10% or it could increase over 60% by 2099.

Whilst changes in trends and mean values is important, the more influential effect of climate change with respect to flood risk and drought is to increase the chance of occurrence and severity of more extreme wet and dry events.

4.8.1 Adapting to climate change

The **PPG Climate Change guidance** contains information for how to identify suitable mitigation and adaptation measures in the planning process to address the impacts of climate change. Examples of adapting to climate change include:

- Considering future climate risks when allocating development sites to ensure risks are understood over the development's lifetime
- Considering the impact of and promoting design responses to flood risk and coastal change for the lifetime of the development
- Considering availability of water and water infrastructure for the lifetime of the development and design responses to promote water efficiency and protect water quality
- Promoting adaptation approaches in design policies for developments and the public realm for example by building in flexibility to allow future adaptation if needed, such as setting new development back from watercourses

At county level, ESCC adopted an **Environmental Management Policy** in December 2023. The policy involves the adoption of a sustainable approach to operation, balancing needs against an awareness of the economic, social and environmental limitations faced as a society. ESCC also produces an annual **Greenhouse Gas Emissions Report** summarising the emissions of greenhouse gases from estate and transport operations.

At the local level, **Rother District Local Plan Core Strategy** outlines the policies of the district for mitigating and adapting to impacts of climate change and the efficient use of resources. These include EN6, covering the need to protect communities wherever practical from flooding to a level that accounts for future climate change and Policy EN7, covering the need to account for flood risk at all stages of the planning process to build in resilience to anticipated climatic changes. Additional policies were developed for the **Development and Site Allocations Local Plan (DaSA)** which includes more detailed policies relating to development management. These policies include DEN5 which covers the use of Sustainable Drainage Systems (SuDS) and DEN6 which relates to the impacts of infiltration systems on ground stability in Pett and Fairlight.

It is recommended that the differences in flood extents from climate change are compared by the Council when allocating sites, to understand how much additional risk there could be, where this risk is in the site, whether the increase is marginal or activates new flow paths, whether it affects access/ egress and how much land could still be developable overall. Recommendations for development are made for the levels of risk in the SFRA guide to using technical data in Appendix O.

5 Sources of information used in preparing the SFRA

This chapter describes the key sources of flood risk information used within this SFRA. Refer to the SFRA guide to using technical data in Appendix O for recommendations and details on how to apply the Sequential and Exception tests using the data set out in this section.

5.1 Historic flood risk

The historic flood risk in the Local Plan areas has been assessed using point information of recorded incidents provided by East Sussex County Council, the Environment Agency's recorded flood outline dataset and Southern Water's Sewer Incident Report Form (SIRF) dataset.

This has been supplemented with other information from East Sussex County Council's PFRA and LFRMS, Environment Agency Flood Investigation reports and news reports. The key considerations from these sources are outlined in Section 6.1. Historic flood mapping for the Rother District can be found in Appendix A. Guidance on how this information should be used to inform the Sequential and Exception Tests can be found in Appendix O.

5.2 Flood Zones

Flood Zones 2, 3a and 3b have been compiled for Rother District as part of this SFRA. Flood Zones are based on the undefended scenario with the exception of Flood Zone 3b, which includes the presence of defences on the basis that land behind existing defences is not functional floodplain. Undefended is interpreted to mean that flooding is not constrained by formal raised flood defences. Therefore the Flood Zones ignore the effect of defences in reducing the probability of flooding but do not underestimate the extents of flooding where defences increase the area potentially at risk. The Flood Zones presented in this SFRA should be used for the basis for decision making in the Rother District Council Local Plan review.

Flood zone mapping is only available where hydraulic modelling has been undertaken and therefore there are some areas (typically watercourses with a catchment area of less than 3km^2) where the fluvial flood risk has not been mapped and so are shown to be in Flood Zone 1. In these areas detailed modelling may be required to accurately determine the flood zones.

The mapping in the SFRA identifies Flood Zone 3b as land which would flood with a 3.3% chance (Annual Exceedance Probability) in each and every year (a 1 in 30-year return period), where detailed modelling exists.

Where the 3.3% Annual Exceedance Probability (AEP) outputs are not available, but other AEPs are available within detailed modelling then these have been used, in this case the 2% and 1.33% AEP modelled scenarios have been used. Where detailed modelling does not exist, Flood Zone 3a has been used as a proxy. If a proposed development is shown to be within these areas, further investigation should be undertaken as part of a detailed site-specific FRA to define and confirm the extent of Flood Zone 3b.

If existing development or infrastructure is shown in Flood Zone 3b, additional consideration should be given to whether the specific location is appropriate for designation as 'Functional' with respect to the storage or flow of water in time of flood. See Section 14 for further details.

Care should be taken when interpreting how Flood Zone 3b is predicted to change as a consequence of climate change. At such locations there may be a possible need to

account for potential changes in the standard of protection provided by flood risk management features.

Flood Zone mapping for the Rother District can be found in Appendix C. The map highlights where a precautionary approach has been used to identify Flood Zone 3b. Guidance on how this information should be used to inform the Sequential and Exception Tests can be found in Appendix O. Table 5-1 displays the datasets used within the creation of Flood Zones for the study area.

Table 5-1: Datasets used to compile Flood Zones

Flood Zone	Watercourse	Dataset
Flood Zone 3b	Picknell Green Stream	3.3% AEP undefended
	River Brede	3.3% AEP defended
	Romney Marsh	2% AEP defended
	River Rother	
	River Tillingham	
	Combe Haven	1.3% AEP defended
	Pevensey and Eastbourne	3.3% AEP defended
Flood Zone 3a	Picknell Green Stream	Existing Environment Agency Flood Zone 3a
	River Brede	
	Romney Marsh	
	River Rother	
	River Tillingham	
	Combe Haven	
	Eastbourne coastline	
Flood Zone 2	Romney Marsh	Existing Environment Agency Flood Zone 2
	River Rother	
	Picknell Green Stream	
	River Brede	
	River Tillingham	
	Combe Haven	
	Eastbourne coastline	

5.3 Fluvial and coastal flood risk models used in this SFRA

Table 5-2 lists the flood risk modelling used to inform the SFRA.

Table 5-2: Flood risk models used in the Level 1 SFRA

Model name	Year	Software (type)
Picknell Green Stream (Fluvial)	2018	Flood Modeller-TUFLOW
River Brede (Fluvial)	2018	Flood Modeller-TUFLOW
River Rother (Fluvial)	2020	Flood Modeller-TUFLOW
Tillingham (Fluvial)	2020	Flood Modeller-TUFLOW
Romney Marsh (Coastal/tidal)	2020	SWAN / TUFLOW
East Sussex (Coastal/tidal)- consists of Eastbourne and Combe Haven models	2020	SWAN / TUFLOW
Pevensey and Eastbourne (Coastal/tidal)	2023	SWAN / TUFLOW

5.3.1 Climate change for fluvial, tidal and coastal flood risk

The Environment Agency guidance **Flood risk assessment: climate change allowances** shows that for watercourses in the Rother Management Catchment the 28%, 38% and 66% fluvial allowances should be considered. Although the SFRA should consider the next 100 years up until 2124, the current fluvial allowances available only consider up until 2115.

The climate change allowances used in the detailed modelling are generally slightly higher than those set-out above as they are based on older data. However, these have still been used as they are seen as a more conservative approach.

Where there is no fluvial model available, Flood Zone 3a has been used to provide indicative information on the potential effects of climate change. This level of assessment is suitable for an SFRA. However, detailed hydraulic modelling using topographic survey would be required at a site-specific level to confirm the flood risk to these sites.

As climate change modelling was found to not be available for any of the models for Flood Zone 3b an assessment was carried out to identify the model flows that would correspond to a 3.3% AEP event plus an allowance for climate change for each of the models. The available model results were then assessed to identify the event with the nearest peak river flow to the require 3.3% AEP plus climate change flow. Table 5-3 sets out the findings of this assessment.

Table 5-3: Model AEPs used to define Flood Zone 3b with climate change

	Flood Zone 3b AEP / Peak flow	Climate change uplift	Future peak flow (m^3/s)	Nearest existing model AEP / Peak flow
Picknell Green Stream (Fluvial)	3.3% (3.8m^3/s)	43%	5.4	0.5% AEP (5.6m^3/s)
River Brede (Fluvial)	3.3% (42.5m^3/s)	38%	58.6	1% AEP (56.9m^3/s)

	Flood Zone 3b AEP / Peak flow	Climate change uplift	Future peak flow (m^3/s)	Nearest existing model AEP / Peak flow
River Rother (Fluvial)	2% (349.2m^3/s)	38%	54.9	1% AEP + 20% (518.0m^3/s)
Tillingham (Fluvial)	2% (39.8m^3/s)	38%	481.9	1% AEP +20% (57m^3/s)

For tidal climate change the Environment Agency guidance provides sea level rise allowances for four epochs up to 2125.

For further information on climate change allowances please refer to Section 4.2. Table 5-4 summarises what datasets have been used to determine future flood risk within Rother District. The Romney Marsh, East Sussex, River Rother and River Tillingham models were updated as part of this study in order to account for the latest fluvial and tidal uplifts.

Mapping of fluvial and tidal flood risk including an allowance for climate change can be found in Appendix D. Guidance on how this information should be used to inform the Sequential and Exception Tests can be found in Appendix O.

Table 5-4: Summary of modelled datasets used to inform Flood Zones with climate change allowances

Flood Zone	Fluvial/Tidal Model	Dataset
Flood Zone 3b + CC	Picknell Green Stream	0.5% AEP undefended
	River Brede	1% AEP defended
	River Rother	1% AEP defended + 20% CC
	River Tillingham	
	Pevensey and Eastbourne	3.3% AEP defended Higher Central 2125
	East Sussex – Eastbourne and Combe Haven	FZ3a as proxy
	Romey Marsh	
Flood Zone 3a + Central	Picknell Green Stream	1% AEP + undefended 35% CC
	River Brede	
	River Rother	
	River Tillingham	

Flood Zone	Fluvial/Tidal Model	Dataset
	East Sussex – Eastbourne and Combe Haven	N/A
	Romney Marsh	
Flood Zone 3a + Higher Central	Picknell Green Stream	1% AEP undefended + 45% CC
	River Brede	
	River Rother	
	River Tillingham	
	East Sussex- Eastbourne and Combe Haven	0.5% AEP Tidal Higher Central 2115
	Romney Marsh	
Flood Zone 3a + Upper End	Picknell Green Stream	N/A
	River Brede	
	River Rother	
	River Tillingham	
	East Sussex- Eastbourne and Combe Haven	0.5% AEP Tidal Upper End 2115
	Romney Marsh	

Please note that the Picknell Green Stream does not benefit from flood defences, therefore the undefended model outputs have been used to determine the flood zones.

5.4 Surface Water

Flooding from surface water runoff (or 'pluvial' flooding) is caused by intense short periods of rainfall. It often occurs where the natural (or artificial) drainage system is unable to cope with the volume of water. Surface water flooding problems are inextricably linked to issues of poor drainage (or drainage blockage by debris) and sewer flooding.

Mapping of surface water flood risk in the Local Plan area has been taken from the Risk of Flooding from Surface Water (RoFSW) published online by the Environment Agency. These maps are intended to provide a consistent standard of assessment for surface water flood risk across England and Wales in order to help LLFAs, the Environment Agency and any potential developers to focus their management of surface water flood risk. The different surface water risk categories used in the RoFSW mapping are defined in Table 5-5.

The RoFSW is derived primarily from identifying topographical flow paths of existing watercourses or dry valleys that contain some isolated ponding locations in low lying areas. They provide a map which displays different levels of surface water flood risk depending on the annual probability of the land in question being inundated by

surface water. The RoFSW mapping is generally based on national modelling and therefore should be used as an indication of flood risk only. As a result, more detailed site specific surface water modelling may be required. It is recommended that developers consult with East Sussex County Council as the LLFA at the earliest opportunity.

Table 5-5: Surface water risk categories used in the RoFSW mapping

Category	Definition
High	Flooding occurring as a result of rainfall with a greater than 1 in 30 chance in any given year (3.3% AEP)
Medium	Flooding occurring as a result of rainfall of between 1 in 100 (1% AEP) and 1 in 30 (3.3% AEP) chance in any given year.
Low	Flooding occurring as a result of rainfall of between 1 in 1,000 (0.1% AEP) and 1 in 100 (1% AEP) chance in any given year.
Very Low	Flooding occurring as a result of rainfall with less than 1 in 1,000 (0.1% AEP) chance in any given year.

Although the RoFSW offers improvement on previously available datasets, the results should not be used to understand flood risk for individual properties. The results should be used for high level assessments such as SFRAs for local authorities. If a particular site is indicated in the Environment Agency mapping to be at risk from surface water flooding, a more detailed assessment should be considered to more accurately illustrate the flood risk at a site-specific scale. Such an assessment will use the RoFSW in partnership with other sources of local flooding information, to confirm the presence of a surface water risk at that particular location.

The RoFSW map for Rother District can be found in Appendix F. Guidance on how this information should be used to inform the Sequential and Exception Tests can be found in Appendix O.

5.4.1 Surface water flood risk with climate change uplifts

Additional modelling has been carried out to account for the impact of climate change on surface water flood risk in the SFRA study area. The Environment Agency guidance **Flood risk assessment: climate change allowances** shows that increases in the peak rainfall intensity in small and urban catchments should be considered when preparing FRAs. The recommended central and upper end allowances for the 2070's epoch are 20% and 45% for the Rother Management Catchment, 20% and 40% for the Medway Catchment, and 25% and 45% for the Pevensey and Cuckmere catchment.

Therefore, the peak rainfall intensities for the 3.3% AEP event have been uplifted by 20% for the central allowance and 40% for the upper end allowance. For the 1% and 0.1% AEP events, the rainfall intensities have been uplifted by 20% and 25% for the central allowance, and 45% for the upper end allowance, to assess the impact of climate change on surface water flood risk in the Rother District.

Mapping showing the extents of the 3.3%, 1% and 0.1% AEP events plus central and upper end allowances can be found in Appendix G. Guidance on how this information should be used to inform the Sequential and Exception Tests can be found in Appendix O.

5.4.2 Critical drainage areas

Critical drainage areas are defined by the Town and Country Planning (General Development Procedure Amendment No. 2, England) Order 2006 as "*an area within Flood Zone 1 which has critical drainage problems and which has been notified [to] the local planning authority by the Environment Agency*". These can cover wide areas within both rural and urban environments and are typically where man-made drainage infrastructure has been identified as at critical risk of failure, resulting in flooding. An absence of critical drainage areas does not mean there are no areas with potential drainage problems.

No formal critical drainage areas have been identified within Rother District by the Environment Agency. However, the Fairlight/Pett area (**DaSA** Figure 11) has been identified within the DaSA as being an area of concern with regard to surface water drainage. This is due to the potential impacts the use of infiltration systems may have on ground stability in the area, which may exacerbate issues with erosion of the cliffs in Fairlight.

5.5 Groundwater

JBA has developed a range of Groundwater Flood Emergence Map products at the national scale. The 5m resolution JBA Groundwater map has been used within the SFRA. The modelling involves simulating groundwater levels for a range of return periods (including 75, 100 and 200-years). Groundwater levels are then compared to ground surface levels to determine the head difference in metres. The JBA Groundwater Map categorises the head difference (m) into five feature classes based on the 100-year model outputs which are outlined in Table 5-6.

Table 5-6: JBA Groundwater flood risk map categories

Flood depth range during a 1% AEP flood event	Groundwater flood risk
Groundwater levels are either at or very near (within 0.025m of) the ground surface.	Within this zone there is a risk of groundwater flooding to both surface and subsurface assets. Groundwater may emerge at significant rates and has the capacity to flow overland and/or pond within any topographic low spots.
Groundwater levels are between 0.025m and 0.5m below the ground surface.	Within this zone there is a risk of groundwater flooding to both surface and subsurface assets. There is the possibility of groundwater emerging at the surface locally.
Groundwater levels are between 0.5m and 5m below the ground surface.	There is a risk of flooding to subsurface assets but surface manifestation of groundwater is unlikely.
Groundwater levels are at least 5m below the ground surface.	Flooding from groundwater is not likely.
No risk.	This zone is deemed as having a negligible risk from groundwater flooding due to the nature of the local geological deposits.

It is important to note that the modelled groundwater levels are not predictions of typical groundwater levels. Rather they are flood levels i.e. groundwater levels that

might be expected after a winter recharge season with 1% AEP, so would represent an extreme scenario.

It should be noted that as the JBA Groundwater Flood Map is based on national modelling it should only be used for general broad-scale assessment of the groundwater flood hazard in an area and it is not explicitly designed for the assessment of flood hazard at the scale of a single property. In high risk areas a site-specific risk assessment for groundwater flooding is recommended to fully inform the likelihood of flooding. East Sussex County Council should be consulted at the earliest opportunity to understand local groundwater issues around development sites and developers should prioritise groundwater monitoring to further understand local impacts.

The JBA Groundwater Map for the Local Plan areas can be found in Appendix H. Guidance on how this information should be used to inform the Sequential and Exception Tests can be found in Appendix O.

5.6 Sewers

Historical incidents of flooding are detailed by Southern Water through their Sewer Incident Report Form (SIRF). This database records incidents of flooding relating to public foul, combined or surface water sewers and displays properties that suffered both internal and external flooding. For confidentiality reasons, this data has been supplied based on X and Y coordinates from the SIRF for incidents recorded in the study area. The database covers reported incidents of sewer flooding since 1986. The SIRF for the Local Plan area can be found in Table 6-4. Mapping of this data, indicating the quantities of recorded flood incidents in each WFD Catchment, is shown in Figure 6-7.

Southern Water have also provided details of planned schemes within the Rother area, included as Figure 6-8.

No drainage issues were identified by Southern Water as part of this study. However, they may undertake site specific sewer capacity assessments when an application is made to connect to a sewer.

5.7 Reservoirs

The risk of inundation due to reservoir breach or failure of reservoirs within the area has been assessed using the Environment Agency's Risk of Flooding from Reservoirs dataset.

The Risk of Flooding from Reservoirs mapping for the Local Plan area can be found in Appendix I. Guidance on how this information should be used to inform the Sequential and Exception Tests can be found in Appendix O.

5.8 Suite of maps

Mapping can be found in the appendices to this SFRA. These are presented in the following structure:

- Appendix A: Historical flooding
- Appendix B: Watercourses
- Appendix C: Fluvial and tidal Flood Zones
- Appendix D: Fluvial and tidal flood risk maps, including climate change allowances
- Appendix E: Coastal erosion risk map
- Appendix F: Surface water flood risk map
- Appendix G: Surface water climate change flood risk map

- Appendix H: JBA Groundwater Flood Map
- Appendix I: Reservoir inundation map
- Appendix J: Flood Defences
- Appendix K: Reduction in Risk of flooding from Rivers and Sea due to Defences
- Appendix L: Buffer strips
- Appendix M: Flood Alert and Flood Warning Areas

5.9 Other relevant flood risk information

Users of this SFRA should also refer to other relevant information on flood risk where available and appropriate. This information includes:

- **Rother and Romney Catchment Flood Management Plan (2009), Cuckmere and Sussex Havens Catchment Flood Management Plan (2009) and Medway Catchment Flood Management Plan (2009)**

These provide information on the catchment-wide strategy for flood risk management. It should be ensured that these plans are used to informing flood risk management measures.

- **Battle Surface Water Management Plan (2015), Bexhill Surface Water Management Plan (2016) and Rye Surface Water Management Plan (2015)**

These provide an assessment of the surface water flood risk and outline action plans to manage and mitigate these risks. It should be ensured that these plans are used to inform future development.

- **East Sussex Local Flood Risk Management Strategy (2016)**

This provides information on local flooding issues and the plan for managing risk. It should be ensured that the strategy is used to inform any development and any flood risk management measures are consistent with the strategy.

- **South East River Basin District Flood Risk Management Plan (2016)**

This provides information on the catchment-wide strategy for flood risk management. It should be ensured that this strategy is used to inform any flood risk management measures.

- **South Foreland to Beachy Head Shoreline Management Plan (2006)**

This provides a large-scale assessment of the risks associated with coastal evolution and presents the policy framework to address these risks in a sustainable manner. It should be ensured that these plans are used to inform any coastline development and flood risk management measures. The SMPs are currently undergoing a refresh.

6 Understanding flood risk in the Rother District

This chapter explores the key sources of flooding in the district and the factors that affect flooding including topography, soils and geology. The main sources of flooding are from watercourses, tidal surges, surface water, sewers and culvert blockages. Refer to the SFRA guide to using technical data in Appendix O for recommendations and details on how to apply the Sequential and Exception tests using the data set out in this section.

6.1 Historical flooding

The Local Plan area has a long history of recorded flood events caused by multiple sources of flooding.

Information collated from the Environment Agency's recorded flood outlines, ESCC's recorded flood incidents, Southern Water's Sewer Incident Report Form (SIRF) and National Highways historical flooding datasets were assessed to understand historic flooding in the Local Plan area. This information was supplemented by local flood risk documents and news reports.

The datasets indicate that the most frequent source of flooding is fluvial along main rivers, tidal along the coastline, as well as local drainage and surface water issues.

There have been a number of fluvial flood events recorded along the River Rother, River Tillingham, River Brede, Combe Haven and Picknell Green Stream. Salehurst, Etchingham, Hurst Green, Crowhurst, Fairlight and Robertsbridge are among the areas that have been affected by main river fluvial flooding. According to the Environment Agency's recorded flood outlines, flooding from Ordinary Watercourses has also affected Little Common, Sedlescombe and land in-between Penhurst and Ponts Green.

Camber and Rye Harbour have experienced tidal flooding in the past due to the overtopping of coastal defences.

Battle, Bexhill and Rye SWMP's identify historic records of surface water flooding in these areas, mainly as a result of highway drainage issues. There have been several recorded incidents of sewer flooding across the Local Plan area, with Camber, Winchelsea and Westfield some of the most frequently affected areas.

Groundwater flooding has been recorded in the ward of Ticehurst and Hurst Green. An additional groundwater incident has been recorded in the parish region of Icklesham. In previously marshy areas around Winchelsea Beach, parts of Camber, Normans Bay, Rye and Pett Level, the high-water table has been evidenced to interact with tide locking and a lack of drainage capacity resulting in the susceptibility of these areas to flooding in the past.

Data provided by National Highways indicates that the A21 and A259 are the most affected by flooding, with a total of 810 incidents since 2006. Additionally, flood hotspot status within the area shows that 2 highest hotspots along the A21 are entering the early stages of drainage survey and design.

The key historical incidents of flooding identified are summarised as follows:

- **Autumn/Winter 2000** - A series of three major fluvial flood events led to widespread flooding across Kent and Sussex when watercourses overflowed their banks. Robertsbridge and Etchingham were amongst the worst affected

areas, with 152 properties and 16 properties (including the Railway Station), respectively recorded to have flooded[1]

- **Winter 2013/14 –** Flooding recorded across the Local Plan area during a particularly wet winter. Communities in Robertsbridge and Rye were affected including the flooding of properties in Rye. Flooding also impacted assets across the Local Plan area causing embankment slips along the River Rother and a breach of the Rye Harbour tidal flood wall as a result of a tidal surge on the 5/6 December.[3] [2]
- **Winter 2022/23-** One incident of highway flooding was recorded in the Combe Haven catchment. This occurred along the A259 at Glyne Gap, with blockage of a highway gully after heavy rainfall. No further reports of flooding were received during this period.

Appendix A shows recorded historic flood points and historic flood events extents provided by ESCC and the Environment Agency respectively. Not all the historic data provided had a source of flooding and was therefore classified as 'Unknown'. Additionally, not all the data provided had dates or a description of flooding recorded.

6.2 Demographics

Rother District covers an area of approximately 51,000 hectares and has an estimated population of over 95,000. The population is forecast to increase to around 100,000 by 2028 under the Core Strategy. The largest settlements in the district are Bexhill, Rye and Battle, with estimated populations of 43,000, 9,000 and 6,000 respectively.

6.3 Topography

As shown in Figure 6-1: Elevation across the Local Plan area the topography of the Local Plan area is comprised mainly of higher lying ground, sloping to areas of lower elevation in the east and south west. The higher ground relates to the High Weald Area of Outstanding Natural Beauty (AONB) which covers most of the administrative area, with a maximum topographic high of approximately 198m AOD. The lower lying land runs along the coastline, with most coastal areas located below 5m AOD.

6.4 Geology and soils

The geology of a catchment can be an important influencing factor in the way that water runs off the ground surface. This is primarily due to variations in the permeability of the surface material and bedrock stratigraphy.

Figure 6-2: Bedrock geology in the Local Plan area and Figure 6-3: Superficial deposits in the Local Plan area show the bedrock (solid permeable) formations and the superficial deposits (permeable, unconsolidated) in the Local Plan area respectively.

The underlying geology is almost exclusively sandstone, siltstone and mudstone from the Cretaceous period. Bedrock geology groups identified across the District mostly include the Wealden Group, with a small area in the west of the District situated in the Purebeck Limestone Group.

The District is predominantly underlain by no superficial deposits. However, along the floodplains of main rivers there is a superficial geology of Alluvium (clay) and along the coastline, Raised Marine Deposits (sand and gravel). These low-lying river valley and coastal areas may locally influence groundwater flood risk (see Section

[1] Environment Agency, Kent and South London Winter 2013/14 Floods, Rother and Romney Catchment Report, 2015

[2] Environment Agency, Kent and South London Winter 2013/2014 Floods, December 2013 tidal surge Report, 2015.

6.11). The bedrock layers and superficial deposits are identified as being aquifers that are classified as follows and are shown in Figure 6-4: Bedrock aquifer designations in the Local Plan area and Figure 6-5 respectively:

- **Principal**: layers of rock or drift deposits with high permeability and, therefore, provide a high level of water storage
- **Secondary A**: rock layers or drift deposits capable of supporting water supplies at a local level and, in some cases, forming an important source of base flow to rivers
- **Secondary B**: lower permeability layers of rock or drift deposits which may store and yield limited amounts of groundwater
- **Secondary undifferentiated**: rock types which do not fit into either category A or B.
- **Unproductive Strata**: rock layers and drift deposits with low permeability and, therefore, have a negligible impact on water supply or river base flow.

The bedrock geology in Rother District is classified as a mixture of Secondary aquifers and unproductive strata.

The superficial deposits in Rother District are classified as largely unproductive deposits with areas of Secondary A and Secondary (undifferentiated) aquifers.

Figure 6-1: Elevation across the Local Plan area

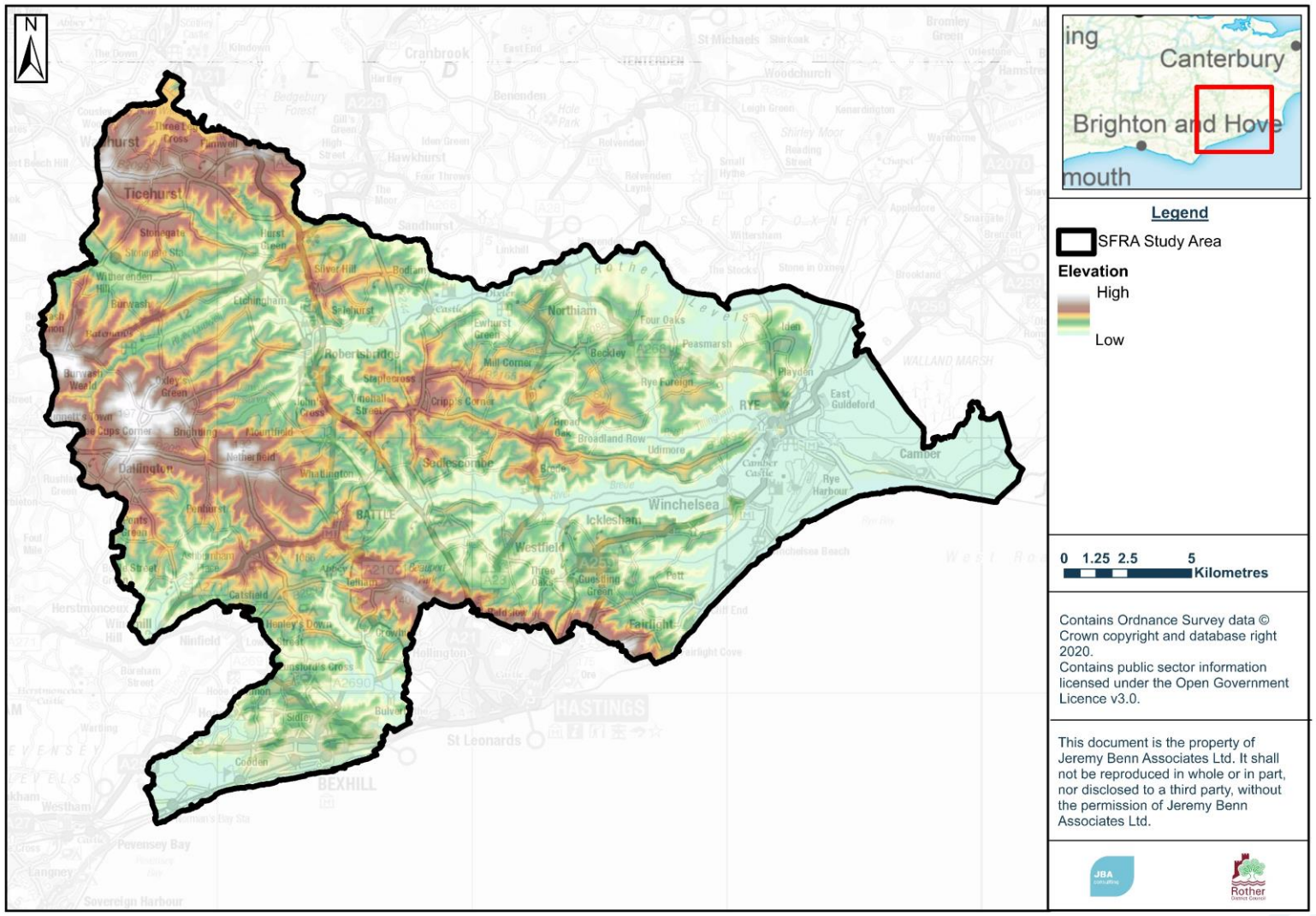


Figure 6-2: Bedrock geology in the Local Plan area

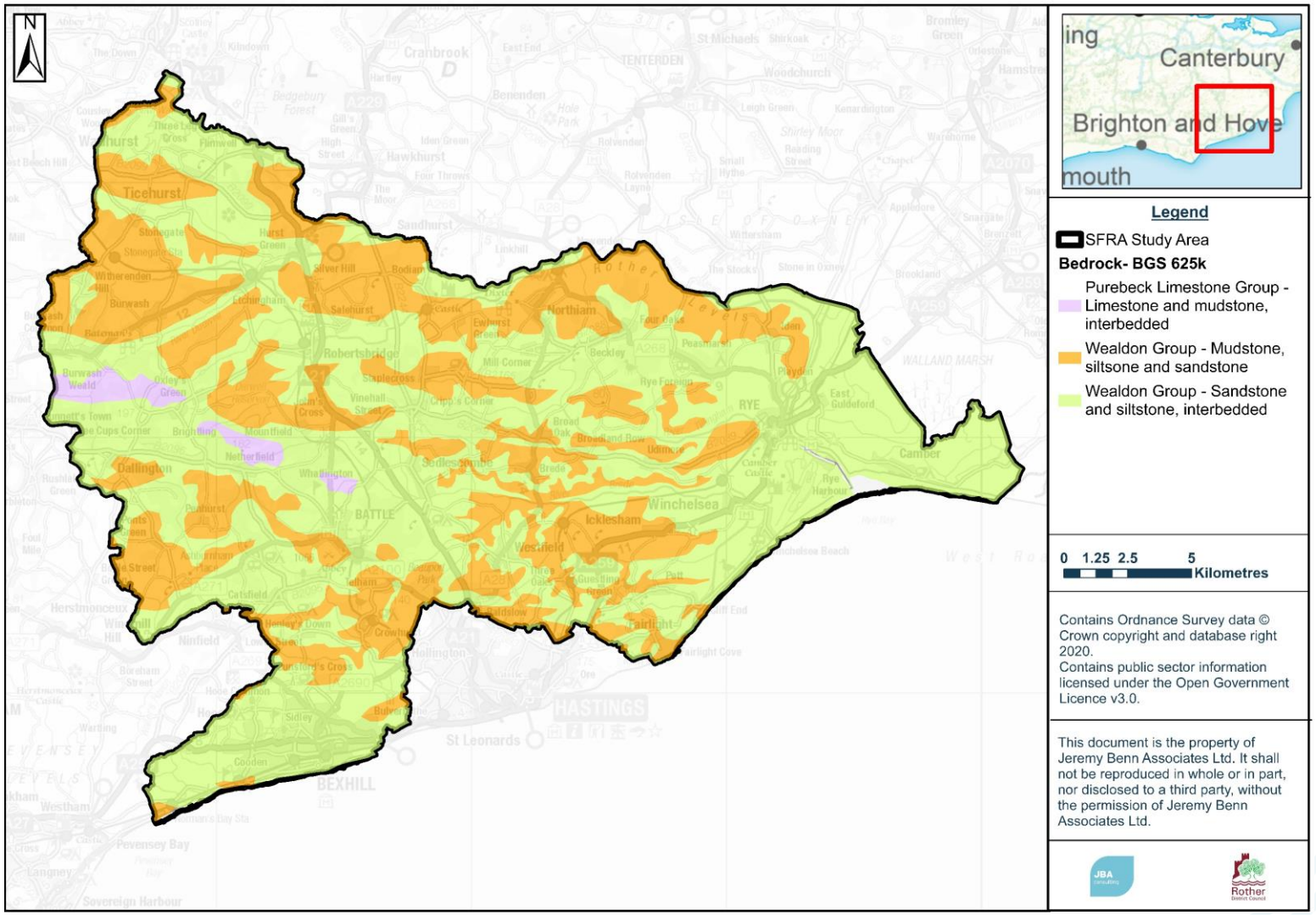


Figure 6-3: Superficial deposits in the Local Plan area

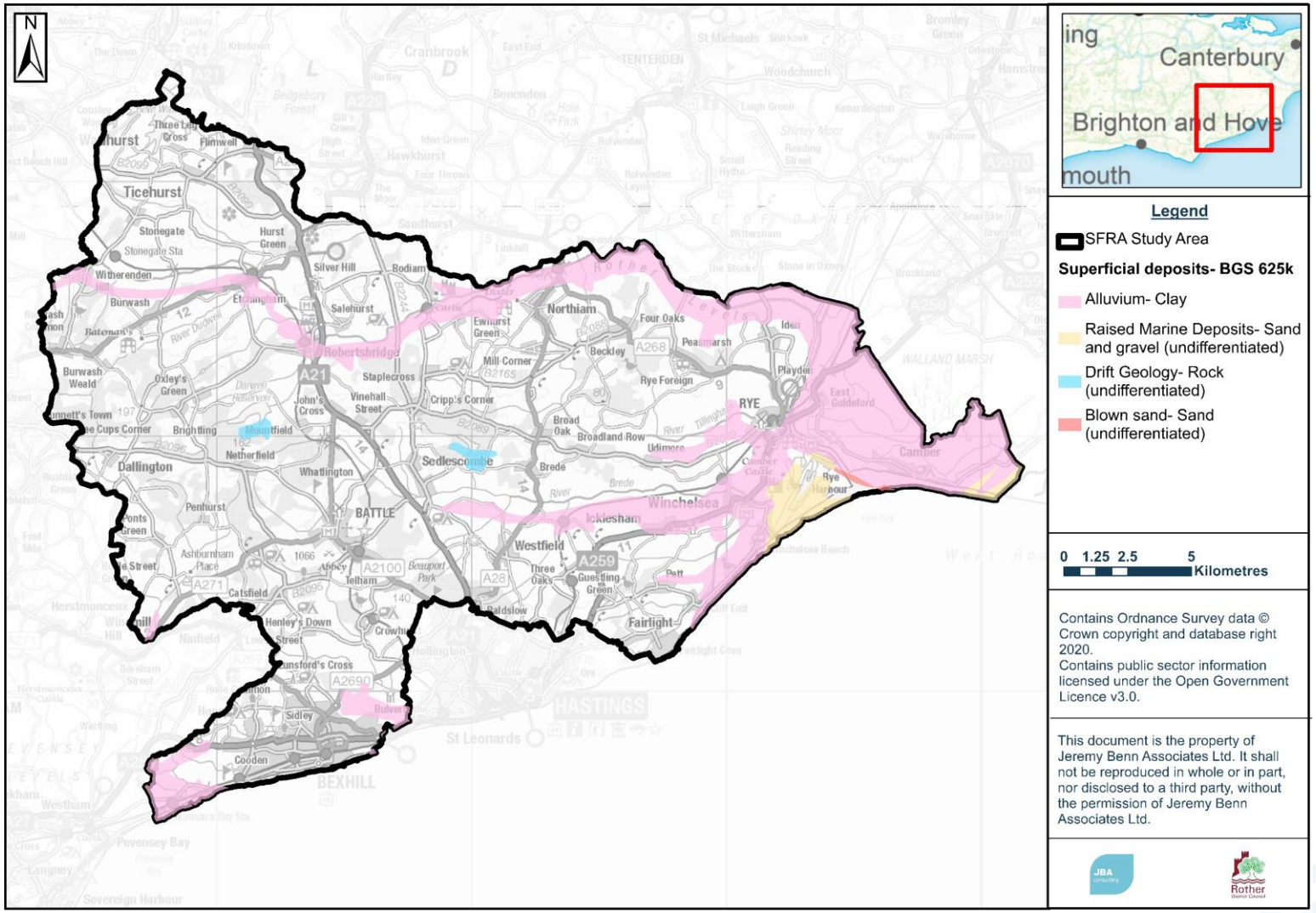


Figure 6-4: Bedrock aquifer designations in the Local Plan area

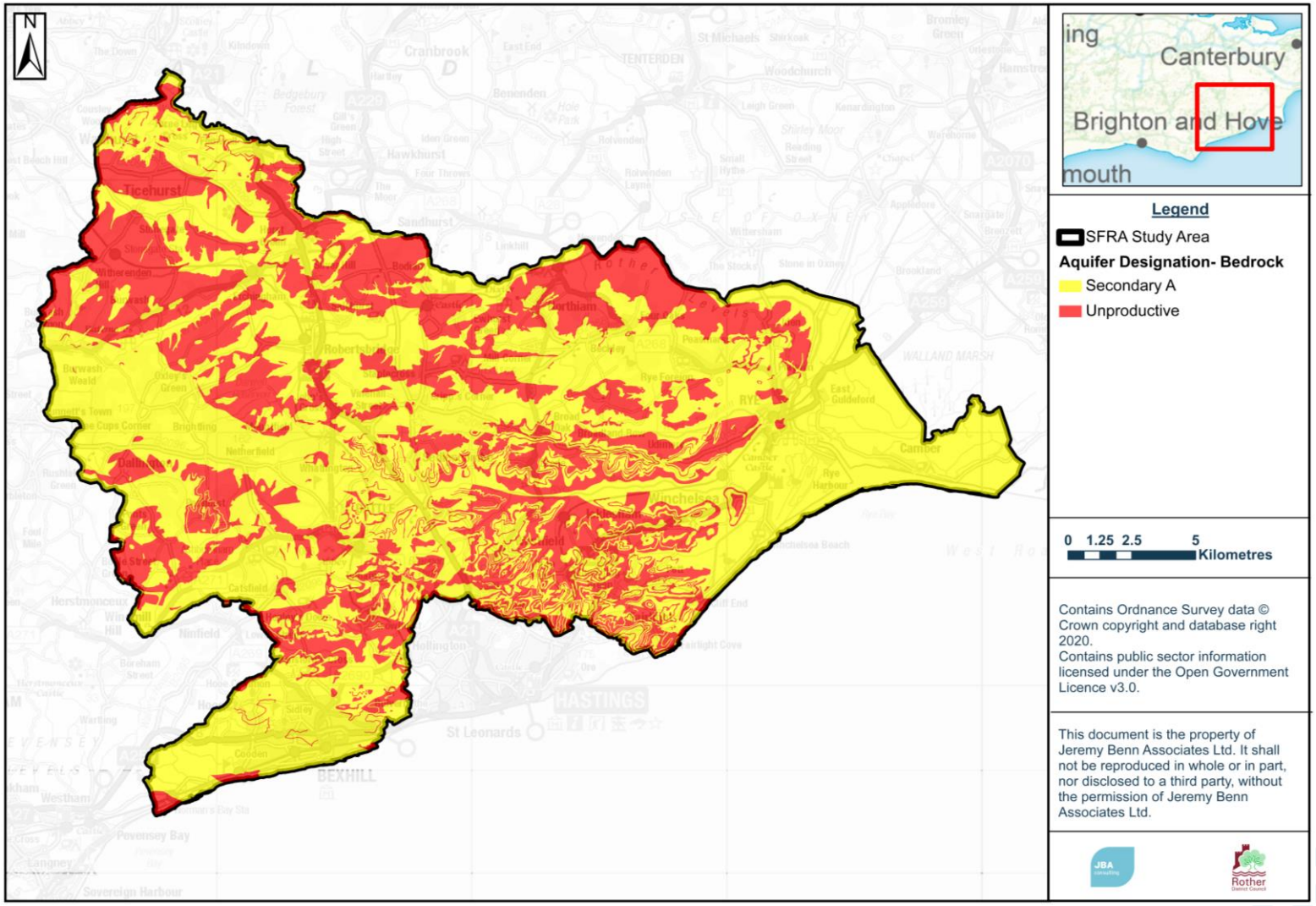
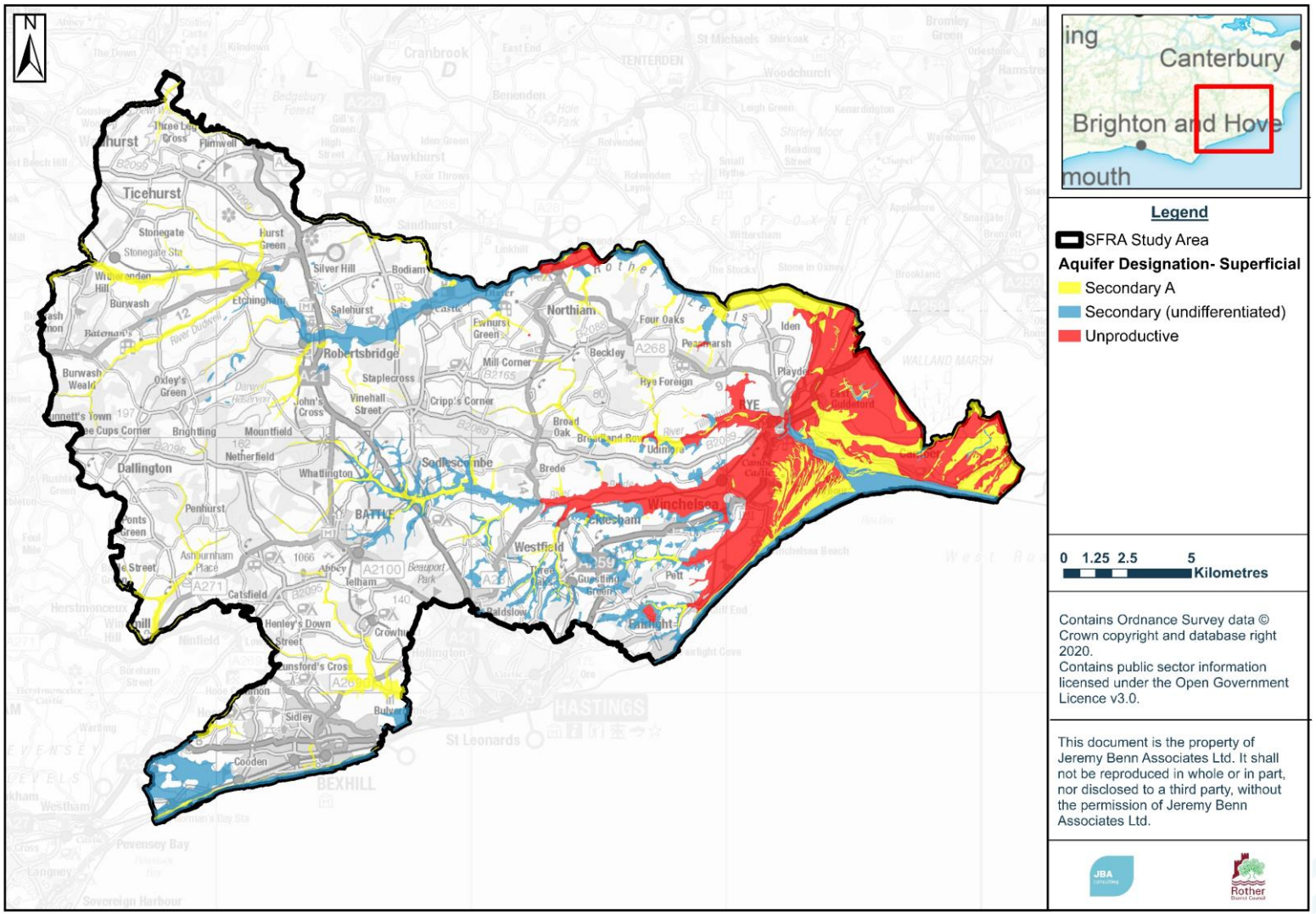


Figure 6-5: Secondary aquifer designations in Local Plan area



6.5 Watercourses

The largest watercourse flowing through the Local Plan area is the River Rother, which enters the north west of Rother District flowing east and then south to Rye, where it enters the English Channel. There are also a number of smaller Main River watercourses in the Local Plan area including the River Tillingham, River Brede, Combe Haven and Picknell Green Stream.

A summary of the main watercourses in the Local Plan area is provided in Table 6-1. Mapping indicating the location of the Main Rivers and Ordinary Watercourses can be found in Appendix B.

Table 6-1: Watercourses in the Local Plan area

Watercourse	Description
River Rother	The River Rother enters Rother District from Withernden Hill, flowing east through Robertsbridge and then the north-eastern boundary of the District, before flowing south through Rye from where it enters the English Channel.
River Tillingham	The River Tillingham rises in Staplecross flowing east through Broad Oak, Broadland Row and Udimore before meeting the River Brede at a confluence south of Rye Harbour.
River Brede	The River Brede rises in Netherfield flowing east through Sedlescombe, Brede and Winchelsea before flowing north where it meets the River Tillingham and eventually the River Rother at Rye Harbour.
River Dudwell	The River Dudwell is a short tributary of the River Rother, that flows north east through Burwash before joining the River Rother at Etchingham.
Royal Military Canal	The Royal Military Canal is split into two sections within the district. The eastern section leaves the River Rother east of Iden and continues in a north-easterly direction, leaving the district after approximately 1km. The western section starts in Pett Level and continues in a north easterly direction for 5km before joining the River Brede.
Nook Drain	Nook drain is a tributary of the River Rother that drains the marshland behind Winchelsea Beach into the River Rother, immediately south of Rye Harbour.
Marsham Sewer	Marsham Sewer is a stream off the Royal Military Canal that flows a short distance through Pett towards Cliff End.
Picknell Green Stream	Picknell Green Stream is located to the north west of Bexhill and drains south west through Highwoods towards the Pevensey Levels.
Combe Haven	Combe Haven flows from the north of Bexhill in an easterly direction before leaving Rother District at Bulverhythe.
Pebsham Stream	Pebsham Stream, located to the east of Bexhill, drains east through Bulverhythe towards Combe Haven.
Powdermill Stream	Powdermill Stream is a tributary of Combe Haven flowing south from Powdermill Lake through Crowhurst before joining Combe Haven near Bulverhythe.

Watercourse	Description
Watermill Stream	Watermill Stream is a tributary of Combe Haven which enters the Local Plan area at Portman's Lane. The Stream flows east before joining Combe Haven to the north east of Bexhill.
Egerton Stream	Egerton Stream drains south through the centre of Bexhill before reaching the English Channel.

6.6 Fluvial flood risk

One of the main sources of flooding in the Local Plan area is fluvial flooding, with many major historic flood events being recorded along the River Rother in particular.

Fluvial flooding often occurs concurrently with surface water and sewer flooding as a response to extreme rainfall events and constrictions within the drainage systems.

Fluvial flooding in the lower catchment of the River Rother, East Stream, Combe Haven and the downstream boundary of Picknell Green Stream, the River Brede and the River Tillingham are influenced by tidal levels, with the potential for tide locking to occur if incoming high tides prevent fluvial flows from discharging into the sea.

The key areas at fluvial flood risk are summarised in Table 6-2, with high risk locations in each ward identified in Table 6-7.

Table 6-2: Areas at risk of fluvial flooding

Area	Source of fluvial flood risk
Robertsbridge	River Rother
Salehurst	River Rother
Etchingham	River Rother
Rye	River Rother

It should be noted that flood risk management measures (defences) are present within the Local Plan area which act to reduce the risk of flooding. Such defences potentially inhibit the function of the river floodplain as during flood events they can prevent water being stored on the land adjacent to the river channel. This may be particularly important when considering the functional floodplain (Flood Zone 3b) for development, but the presence of such defences could also evidence that measures must be in place to make existing development and infrastructure safe. Further details on the defences in Rother District are presented in Section 7 and the Flood Zones are described in Section 5.2.

The extents of the fluvial Flood Zones are shown in Appendix C. Consideration of how climate change may influence the fluvial flood risk is presented in Appendix D.

In addition to flood risk shown by the flood risk mapping, there are a number of ordinary watercourses, small watercourses and field drains which may pose a risk to development. Generalised Flood Zone mapping (where more detailed modelling investigations are not available) has only been prepared for watercourses with a catchment greater than 3km^2. Therefore, whilst these smaller watercourses may not be shown as having flood risk on the flood risk mapping, it does not necessarily mean that there is no flood risk. Sites in proximity to these watercourses may be shown to be inaccurately located in Flood Zone 1. As part of a site-specific flood risk assessment the potential flood risk and extent of flood zones should be determined

for these smaller watercourses and this information used as appropriate to perform the Sequential and Exception tests. The Risk of Flooding from Surface Water (RoFSW) mapping can be used to indicate where this is likely to be an issue.

6.7 Tidal flood risk

Tidal flooding is caused by extreme tide levels exceeding ground and / or defence levels. The tidal flood risk to the Local Plan area has been based on the Romney Marsh Coastal model, the East Sussex Coastal modelling (includes the Eastbourne and Combe Haven Models). Flood Zone mapping can be found in Appendix C and the effects of climate change can be seen in Appendix D.

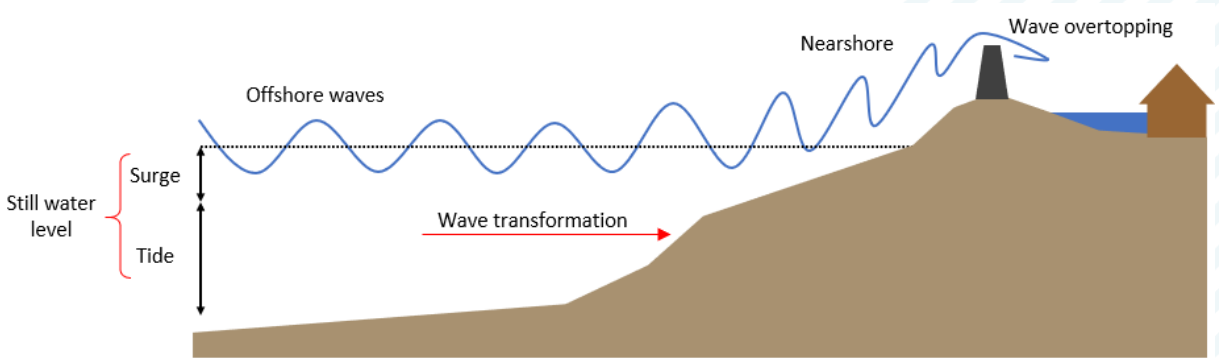
The Local Plan area is bounded to the south by the English Channel. As such, areas of the coastline are at risk of tidal flooding. Major significant tidal events to have affected the Local Plan area include the flood of winter 2013/14 which was caused by the biggest tidal storm surge in 60 years. High risk locations within the wards at risk of tidal flooding are identified in Table 6-7.

The River Rother, River Brede, River Tillingham, East Stream, Combe Haven and Picknell Green Stream are all at risk of tidal flooding in their lower reaches.

6.7.1 Wave overtopping

Tidal flooding along parts of the Rother District coastline is characterised by the presence of risk associated with wave overtopping. In exposed locations along the coast, landward flooding is more likely to occur as a consequence of wave overtopping than inundation. Wave overtopping is a term, which encompasses a number of complex physical processes, which result in the transfer of water from the sea onto the coastal floodplain. The amount of wave overtopping that occurs during an extreme event is dependent on the local water depth, the properties of incoming waves and the geometry of local flood defences. Figure 6-6 outlines the process of wave overtopping in relation to the Extreme Still Water Sea-level.

Figure 6-6: Illustration of residual risk associated with wave overtopping



Areas at risk of wave overtopping include Winchelsea Beach and small areas of Bexhill and Camber.

The effect of wave overtopping along the coastline has only been included in the Flood Zone 3b delineation at locations considered appropriate by the Environment Agency and shown in Appendix D.

6.8 Coastal flood risk

In coastal locations, the risk of flooding is linked to the stability of the coastline. If the coast is eroding, then the potential effect is that tidal flood defences near to the

sea will be lost and flood risk will increase. To maintain an appropriate standard of safety from flooding it is sometimes necessary to implement works to slow down or stop the rate of coastal erosion and so maintain the integrity of the tidal defences.

Coastal erosion mapping for the Local Plan area can be found in Appendix E. The current long-term plan for the length of the coastline within the Local Plan area is mainly to 'Hold the Line' or allow for 'Managed Realignment' with works proposed to manage and mitigate the risk of coastal erosion and flooding[3]. However, this is unlikely to include taking account of additional sea level rises as a result of climate change and there may also be funding gaps for defence maintenance. Developers wishing to understand the latest position should approach The Environment Agency for more information.

Exceptions to these policies include a short section of coastline between Cliff End and Fairlight Cove and at Fairlight Cove West, where a 'No Active Intervention' approach is being taken in order for erosion to create a source of recyclable, protective beach material.

An estimated 3,200 'at risk' properties across the SMP area should be protected by the coastal erosion management and mitigation approaches set out by the South Foreland to Beachy Head SMP over the next 100-years[3]. This includes a number of locations within the Local Plan area including Cliff End, Winchelsea Beach, Rye Harbour, Bexhill and Camber.

6.9 Coastal Change

Coastal Change Management Areas (CCMAs) have been defined for this SFRA using the National Coastal Erosion Risk Mapping (2018 to 2021) dataset and the future functional floodplain (FZ3b plus climate change) as defined within this SFRA for coastal flood risk. Erosional distances were mapped based on the estimated rates of erosion based on the SMP policy for the Long Term time period under the 50th percentile confidence level. The evidence can be used to inform the policies as part of the new local plan, and to inform coastal protection schemes, to reduce future risks to people and property and help communities prepare and plan for future risks.

The Coastal Change Management Area (CCMA) map can be found in Appendix E.

6.10 Surface water flood risk

Flooding from surface water runoff (or 'pluvial' flooding) is caused by intense short periods of rainfall and usually affects lower lying areas, often where the natural (or artificial) drainage system is unable to cope with the volume of water. Surface water flooding problems are inextricably linked to issues of poor drainage or drainage blockage by debris, and sewer flooding.

Surface water flooding poses the greatest risk to properties in Bexhill due to the greatest concentration of people and assets[4]. The Bexhill Surface Water Management Plan (SWMP) identifies Collington Wood, Bexhill Down, Greenleigh Park, Picknell Green Stream, Sidley, Pebsham and Egerton Stream to be particular high-risk areas. Further hotspots of high risk have been identified in Rye (The Strand, Tilling Green Estate, North Salts and the Grove) and Battle (Harrier Lane, Falconer Drive and North Trade Road) through their SWMP's. Analysis of these high-risk areas has identified that for a 1 in 1,000-year surface water event, 441 dwellings in Bexhill would be at

3 Environment Agency, South Foreland to Beachy Head SMP, 2006. Available:https://se-coastalgroup.org.uk/shoreline-management-plans/south-foreland-to-beachy-head/

4 East Sussex County Council, Local Flood Risk Management Stratergy,2016. Available: flood-risk-strategy-2016-26-final-edition-ebook1-1 (4).pdf

risk of flooding[5], 57 properties in Battle[6] and 28 in Rye[7]. Historic surface water flood events in Bexhill and Battle have been most frequently related to blocked or overwhelmed drainage. In Rye these events have been most frequently related to pluvial runoff.

High groundwater can also increase surface water risk. This is largely present along the Rother coastline and on the plains of the Upper River Rother, where the water table lies close to the surface. If the ground becomes saturated, rainfall is unable to drain into the ground, and floods the ground surface[4].

Tide locking is also an issue around Rye and Camber seafront where high tides prevent surface water from draining from gravity outfalls along the defended coastal plain.

The Risk of Flooding from Surface Water (RoFSW) map shows predicted flood extents that predominantly follow topographical flow paths of existing watercourses or dry valleys. Some isolated ponding occurs upslope of topographic features including railway lines and roads. Mapping of the RoFSW throughout the Local Plan area is provided in Appendix F and high risk areas within each ward are identified in Table 6-7.

6.10.1 Impact of climate change on surface water flood risk

Mapping showing the extents of the RoFSW 3.3%, 1% and 0.1% AEP event with the rainfall intensities uplifted by 20% and 25% for the central allowance, and 40% and 45% for the Upper End allowance, can be found in Appendix G. Areas where predicted flood depths and extents increase in the uplifted scenarios are typically small and restricted to flow paths of existing watercourses and roads. However, there are several areas across Rother District that are more sensitive to climate change, where the predicted flood depths and extents increase more notably once rainfall intensities have been uplifted. Table 6-3: Areas sensitive to increased rainfall intensities details some examples of the locations that are identified as being more sensitive to climate change.

Table 6-3: Areas sensitive to increased rainfall intensities

Bexhill	London Road, Westcourt Road and Dorset Road
Rye	Tilling Green, Rye Road and South Undercliff
Battle	London Road, Netherfield Hill and Bowmans Drive
Robertsbridge	Station Road, Bishops Lane and Northbridge Street
Northiam	Quickbourne Lane, Ewhurst Lane and Station Road
Peasmarsh	Main Street, School Lane and Farleys Way

6.11 Groundwater flood risk

Groundwater flooding is the term used to describe flooding caused by unusually high groundwater levels. It occurs as excess water emerges at the ground surface or

5. East Sussex County Council, Rye Stage 1 Surface Water Management Plan, 2015. Available: 2014s1430-rye-stage-1-swmp-v3-july-2015-_lq-2 (2).pdf

6 East Sussex County Council, Bexhill Stage 1 Surface Water Management Plan, 2016. Available: 2015s3262-bexhill-stage-1-swmp-v2-june-2016 (6).pdf

7 East Sussex County Council, Battle Stage 1 Surface Water Management Plan, 2015. Available: 2014s1652-battle-swmp-stage-1-v3-july-2015-_lq (3).pdf

within manmade underground structures such as basements. Groundwater flooding tends to be more persistent than surface water flooding, in some cases lasting for weeks or months, and it can result in significant damage to property.

Groundwater flooding and high groundwater tables, restricting the potential of sustainable drainage systems, is known to be a problem across much of Rother District. In particular, perched aquifers, where gravels and sands are underlain by clay can cause significant issues and are generally not captured within the national mapping.

As illustrated in the mapping, localised areas of higher risk of groundwater emergence are located in the lower catchment of Rother. Areas of marshland surrounding Rye Harbour and Camber demonstrate high risk, with areas where groundwater levels could be at or very close to the ground surface during a 1 in 100-year (1% AEP) flood event. There is potential for saline intrusion to occur in these areas, which is a key consideration affecting groundwater flood risk and the ability to drain surface water. Planners and developers should consult East Sussex County Council as the Lead Local Flood Authority at the earliest opportunity to consider the risk of groundwater flooding and the tidal influence on groundwater levels when preparing detailed Flood Risk Assessments.

The JBA Groundwater Flood Emergence Map can be found in Appendix H. It should be noted that as this information is based on a national dataset and there are likely to be localised differences in groundwater flood risk, particularly where there are perched aquifers. Planners and developers should consult the LLFA to find out if they hold any local information. Further details of the groundwater flood risk across East Sussex can be found within the **East Sussex Local Flood Risk Management Strategy**.

6.12 Flooding from sewers

Sewer flooding occurs when intense rainfall overloads the sewer system capacity (surface water, foul or combined), and / or when sewers cannot discharge properly to watercourses due to high water levels. Sewer flooding can also be caused when problems such as blockages, collapses or equipment (such as pumps) failure occur in the sewerage system. Surface water inundation of manhole openings and entry of groundwater may cause high flows for prolonged periods of time.

Since 1980, the Sewers for Adoption guidelines (**now replaced by the Design Construction Guidance – Appendix C**) have meant that most new surface water sewers have been designed to have capacity for a rainfall event with a 1 in 30 chance of occurring in any given year (3.33% AEP), although until recently this did not apply to smaller private systems. This means that, even where sewers are built to current specifications, they can still be overwhelmed by larger events of the magnitude often considered when looking at river or surface water flooding (e.g. a 1 in 100 chance of occurring in any given year (1% AEP)). Existing sewers can also become overloaded as new development adds to their catchment, even with restrictions in place on permitted discharge, or due to incremental increases in roofed and paved surfaces at the individual property scale (urban creep). Sewer flooding is therefore a problem that could occur in many locations across the study area.

The Baseline Risk and Vulnerability Assessment (BRAVA), completed as part of Southern Water's DWMP for the Rother Catchment, indicates that most areas within the Local Plan area are not at significant risk of internal sewer flooding. However, areas including Camber, Fairlight and Rye are at significant risk of sewer flooding during a 1 in 50 year storm, in both present day and future scenarios. The BRAVA summary document also shows that additional catchments (including those mentioned above) are at moderate or significant risk of flooding due to hydraulic overload. These include the areas of Battle, Robertsbridge and Sedlescombe.

Information from the Southern Water Sewer Incident Report Form (SIRF) database is shown in Table 6-4: Southern Water SIRF records for the Local Plan area. Mapping of this data indicating the number of recorded flood incidents per Water Framework Directive (WFD) Catchment, is shown in Figure 6-7.

The SIRF database indicates a total of 5,171 recorded flood incidents in the Local Plan area since 1986. However, it is important to note that these are not unique incidents, as some incidents affected several properties. The most frequently flooded WFD catchment is the Coastal Catchment of Hastings and Bexhill. It is evident that a total of 1,051 incidents were reported to Southern Water in the Bexhill-on-Sea area in the last 40 years.

Table 6-4: Southern Water SIRF records for the Local Plan area

WFD Catchment	Recorded flood incidents
Walland Marsh/RMC (Iden to Appledore)	1
Tidebrook	1
Pevensey Haven	4
Coastal Catchment 2 (Area east of Rye)	5
Waller Haven between Windmill Hill and Coast	5
Socknersh Stream	6
Coastal Catchment 3 (Rye to Dungeness)	7
Hexden Channel	12
Kent Ditch	21
Watermill Stream	28
Limden	79
Bewl	102
Glottenham Stream	113
Doleham Ditch	114
Tributary of the Brede at Westfield	119
Line	121
Dudwell	134
Walland Marsh at East Guldeford	146
Rother between Coggins Mill Stream and Etchingham	200
Powdermill Stream	233
Combe Haven between Powdermill Str conf and Coast	278
Coastal Catchment 1 (Area west of Rye)	285

WFD Catchment	Recorded flood incidents
East Stream	324
Lower Rother from Etchingham to Scot's Float	394
Brede	431
Tillingham	450
Marsham and Pannel Sewers	479
Coastal Catchment 4 (Hastings and Bexhill)	1051

It is important to recognise that the information does not indicate the cause of the sewer flooding incidents. Also, the register represents a snapshot in time and may become outdated following future rainfall events and when new properties are added. Risk of flooding may be reduced in some locations by capital investment to increase of the capacity of the network.

Southern Water also provided information on current Water Industry National Environment Programme (WINEP) and Flooding Pollution schemes in the Asset Management Plan 8 (AMP82025-30). Mapping of this data is included in Figure 6-8.

6.12.1 Drainage Capacity

There is a wider issue of drainage capacity in the Rother District, particularly in the area of Fairlight which has few existing watercourses or surface water sewers. This has resulted in flooding from the Marsham Sewer and Lower Waites Lane Sewer when the volume of runoff has exceeded design capacity. Consequently, RDC expects all small-scale planning applications in this area to be accompanied by a SuDS report generated by the County Council's online SuDS tool.

Additionally, Pevensey Levels hydrological catchment (**DaSA** Figure 12) has particular drainage requirements, particularly in relation to water quality concerns in the Pevensey Levels Ramsar site. **Core Strategy** Policy SRM2 requires SuDS for all new developments that create additional impermeable areas within this catchment area. The Pevensey and Cuckmere Water Level Management Board also have additional requirements in relation to the discharge of surface water runoff into the wider catchment.

Figure 6-7: Southern Water Sewer Incident Report Form (SIRF) records for the Local Plan area

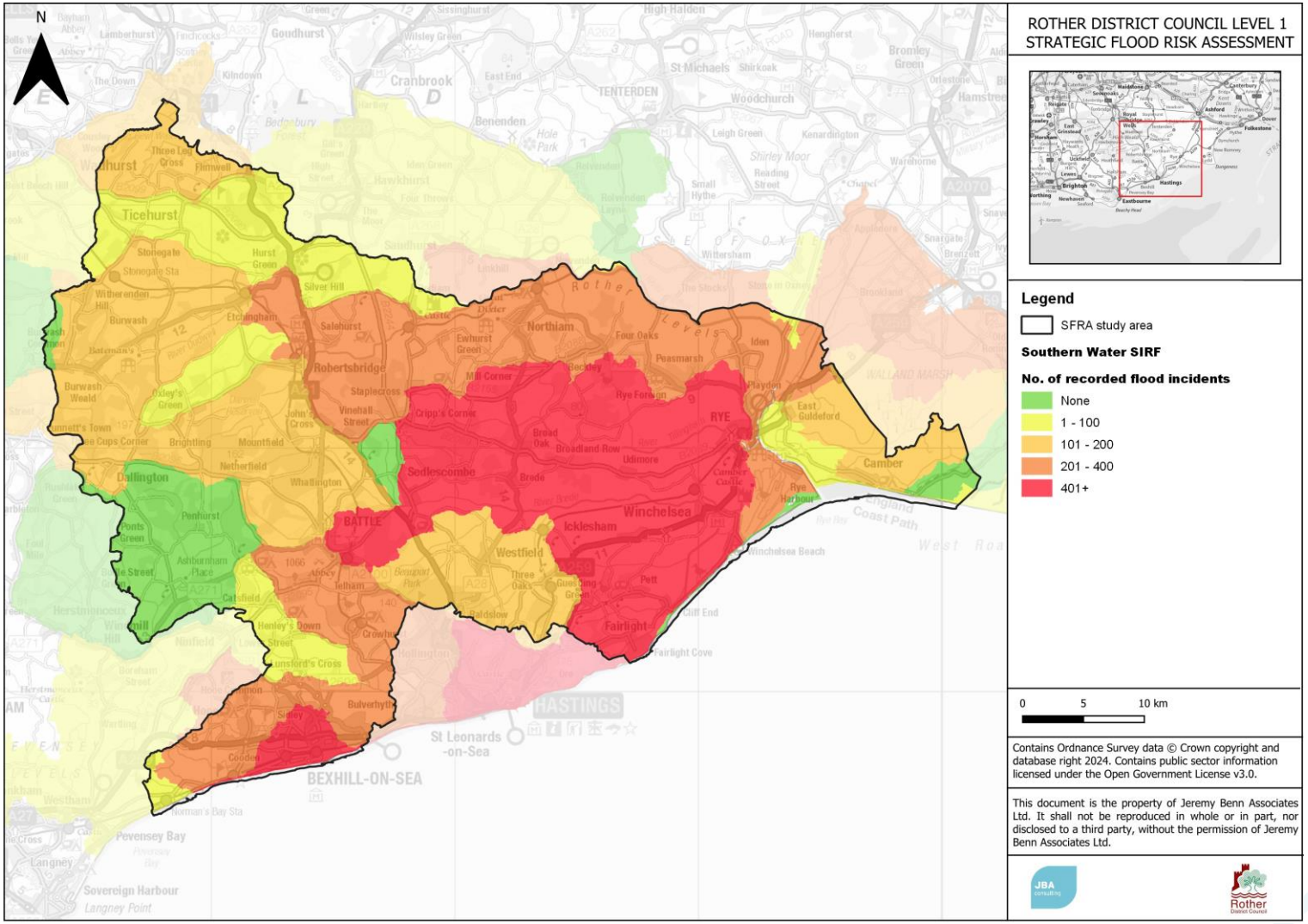
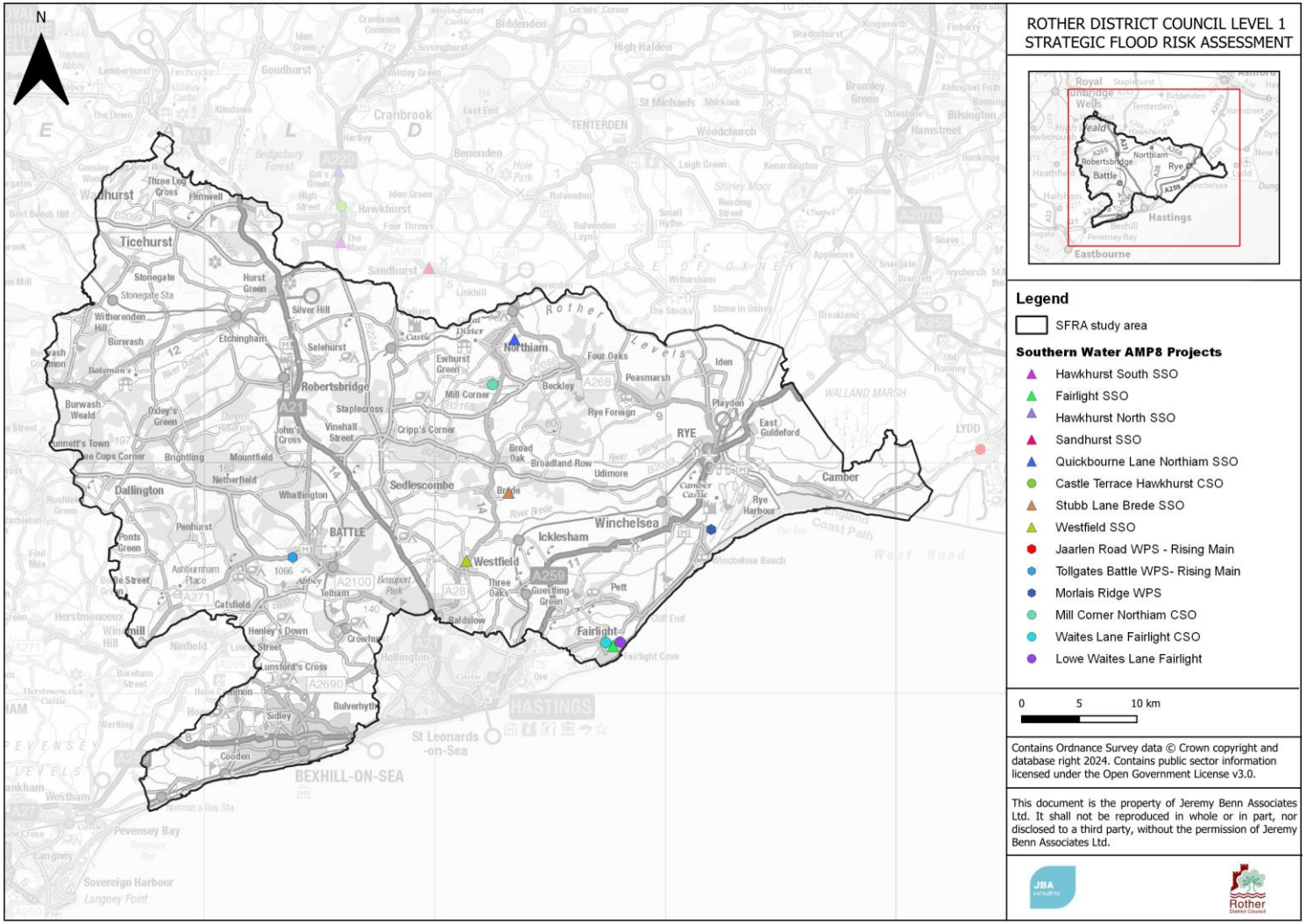


Figure 6-8: Southern Water AMP8 projects (2025-30)



6.13 Flooding from reservoirs

Reservoirs with an impounded volume greater than 25,000 cubic metres are governed by the Reservoir Act 1975 and are listed on a register held by the Environment Agency. The level and standard of inspection and maintenance required under the Act means that the risk of flooding from reservoirs is relatively low. Legislation under the Flood and Water Management Act requires the Environment Agency to designate the risk of flooding from these reservoirs. The Environment Agency is currently progressing a 'Risk Designation' process so that the risk is formally determined.

The risk of inundation due to reservoir breach or failure within the area has been assessed using the Environment Agency's Reservoir Flood Maps (2021).

The Reservoir Flood Maps describe two reservoir flooding scenarios. A "dry day" scenario and a "wet day" scenario.

The "dry day" scenario shows the predicted flood extents if a reservoir failure were to occur when river levels are at normal levels. The "wet day" scenario shows the predicted flood extents if reservoir failure were to occur when river levels are already high and extreme fluvial flooding is already occurring. The "wet day" scenario is used to demonstrate the combined effect of fluvial and reservoir flooding due to the potential probability of reservoir failure occurring due to extreme rainfall.

The Reservoir Flood Maps also include a "fluvial contribution" scenario. This layer shows the fluvial flood extents which were used by the Environment Agency to calculate the "wet day" scenario. The fluvial flood extent shown is based on an extreme fluvial flood and is not the same as Flood Zones 2 and 3. Table 6-5: Reservoirs in the Local Plan area shows the reservoirs located within Rother District that may impact the Local Plan Area and Table 6-6 highlights those outside Rother District that may impact the Local Plan area (i.e. the breach extent from this reservoir affects parts of Rother District). Areas at risk of flooding from reservoirs include Robertsbridge, Etchingham and Salehurst.

Table 6-5: Reservoirs in the Local Plan area

Reservoir	Location (NGR)	Physical status	Year Built
Ashburnham Lakes - Broadwater	TQ6870014300	In Operation	1830
Ashburnham Lakes - Frontwater	TQ6920014600	In Operation	1850
Ashburnham Lakes - Reservoir Pond	TQ6970014900	In Operation	1766
Bewl Water Reservoir	TQ6788633066	In Operation	1975
Darwell Reservoir	TQ7150021200	In Operation	1950
Powdermill Reservoir	TQ8000019600	In Operation	1933

Table 6-6: Reservoirs outside the Local Plan area

Reservoir	Location (NGR)	Physical status	Year Built
Wishing Tree Reservoir	TQ7800010600	In Operation	1974

Reservoir flooding is very different from other forms of flooding. It may happen with little or no warning. The Environment Agency maps represent a credible worst-case scenario. In these circumstances, it is the time to inundation, the depth of inundation, the duration of flooding and the velocity of flood flows that will be most influential. The Environment Agency Risk of Flooding from Reservoir Map for the Local Plan area is shown in Appendix I. This data is intended for emergency planning. If used by developers, the residual risk of reservoir flooding should be considered within a detailed flood risk assessment.

6.14 Canal flood risk

Canals are regulated waterbodies and are unlikely to flood unless there is a sudden failure of an embankment or a sudden ingress of water from a river in areas where they interact closely. Embankment failure can be caused by:

- Culvert collapse
- Overtopping
- Animal burrowing
- Subsidence/ sudden failure e.g. collapse of former mine workings
- Utility or development works close or encroaching onto the footings of a canal embankment

Flooding from a breach of a canal embankment is largely dictated by canal and ground levels, canal embankment construction, breach characteristics and the volume of water within the canal that can discharge into the lower lying areas behind the embankment. The volume of water released during a breach is dependent on the pound length (i.e. the distance between locks) and how quickly the operating authorities can react to prevent further water loss, for example by the fitting of stop boards to restrict the length of the canal that can empty through the breach, or repair of the breach.

The only canal located in Rother District is the Royal Military Canal, this is split into two sections within the district. The easterly section is connected to the River Rother east of Iden and continues in a north-easterly direction towards Appledore, leaving the district after approximately 1km. The second section starts in Pett Level and continues in a north-easterly direction for approximately 5km before joining the River Brede, just east of Winchelsea.

In addition to shipping, the canal was designed for flood risk management purposes, acting as a sink for the network of drainage ditches in the area. The canal is under Environment Agency management. When water on surrounding land is low in summer, and water is needed to irrigate the land, water can be pumped from the canal into drainage ditches. In winter if there is a risk of flood, water can be taken from the ditches into the canal. In order to act as a sink the canal is low lying and not raised above surrounding land. Therefore, any risk of flooding to nearby areas from the canal remains very low.

6.15 Summary of flood risk to key settlements

A high-level review of the flood risk to each ward in the Rother District Local Plan area has been undertaken. Table 6-7 summarises the flood risk to each ward within the Local Plan area.

Figure 6-9: Wards within Rother District

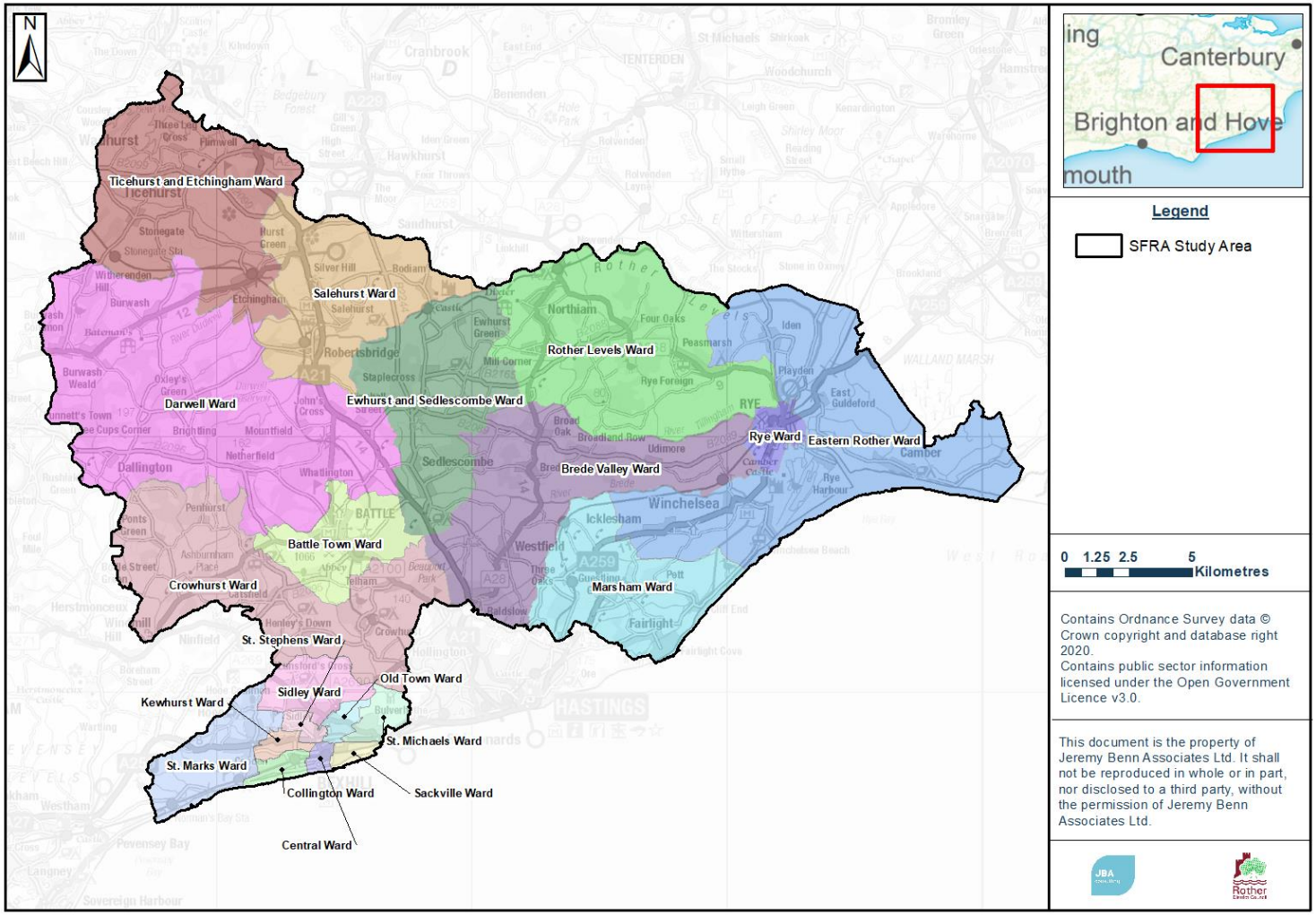


Table 6-7: Summary of flood risk to each ward in Rother District

	Fluvial/tidal/coastal flood risk	Formal flood defences	Surface water flood risk	Susceptibility to groundwater flooding, according to JBA map					Reservoir inundation
				No risk	5m below surface	0.5m to 5m below the surface	0.025m to 0.5m below surface	Within 0.025m of surface	
Battle Town	Battle Town is at a minor risk of fluvial flooding from the Powdermill Stream and the River Brede. Flood Zones 2 and 3 are generally restricted to open floodplain surrounding the watercourses in the north east and south west of the ward.	See Section 7	Areas of high surface water flood risk are identified around the drainage network of Powdermill Stream and the River Brede. Risk is greatest in the centre of Battle where flooding of main roads is predicted, including High Street, North Trade Road, London Road and Battle Hill.	✓	✓	✓	✓	✓	None
Brede Valley	Brede Valley is bounded to the north by the River Tillingham and the River Brede flows through the centre of the ward. Large expanses of floodplain are located within Flood Zone 3b, however no residential areas are thought to be at risk.	See Section 7	Mapping shows vast areas of high surface water flood risk that generally follow surface topography and correspond to low lying areas surrounding the River Brede and River Tillingham network. A vast area of surface water ponding is identified at Powdermill Reservoir.	✓	✓	✓	✓	✓	Inundation from the Powdermill Reservoir, in the east of the ward, may affect floodplain areas on both sides of the River Brede channel.
Central	Central ward is located on the coast, with the south of the ward at risk of coastal/ tidal flooding. Areas along West Parade and Egerton Road are situated in Flood Zone 3b.	No	Mapping shows a distinct flow path from north east to south west down Buckhurst Road. High surface water flood risk is identified in Egerton Park where flows pond. Wainwright Road and Car Park are also at a high risk of surface water flooding.	✓		✓			None
Collington	Collington ward is located on the coast, with the south east of the ward at risk of coastal/ tidal flooding around West Parade. This area is located within Flood Zone 3b.	No	Mapping shows a relatively wide surface water flow path along Collington Avenue and Westcourt Drive, that ponds in the open area at the Polegrove. Surface water is also predicted to pond to the north of the railway line.	✓	✓	✓			None
Crowhurst	There is fluvial flood risk in Crowhurst from Combe Haven, Powdermill Stream, Watermill Stream and Waller's Haven. Flood Zones 2 and 3 are generally restricted to open floodplain surrounding these watercourses. However, a number of roads may be at risk of localised flooding including Combe Valley Way, Sandrock Hill, Crowhurst Road and Watermill Lane.	See Section 7	High surface water flood risk generally corresponds to the expansive drainage network areas of Combe Haven, Powdermill Stream, Watermill Stream, Waller's Haven and the River Brede. Significant areas of ponding are predicted to occur on the floodplains surrounding Combe Haven in the south of the ward, and in the Ashburnham Lakes.	✓	✓	✓	✓	✓	Inundation from the Ashburnham Lakes, in the south west of the ward, may affect areas of Ashburnham and floodplain either side of Waller's Haven. Combe Haven floodplain in the south east of the ward is also at risk of flooding from the Wishing Tree Reservoir, located west of Hastings.
Darwell	Darwell ward is at a minor risk of fluvial flooding from the River Rother, River Dudwell and River Brede. Flood Zones 2 and 3 are generally restricted to open areas surrounding the watercourses and no residential areas are believed to be at risk.	See Section 7	Mapping shows an extensive network of surface water flow paths from south west to north east. These flow paths follow surface topography and correspond to low lying floodplain areas of the River Rother network. High surface water flood risk is identified at Darwell Reservoir where flows pond.	✓		✓	✓		Inundation from Darwell Reservoir, in the north east of the ward, may cause flooding either side of the River Brede channel.
Eastern Rother	Eastern Rother ward is at a high risk of flooding from a combination of fluvial, tidal and coastal sources. Significant residential areas at risk include Camber, Rye Harbour and Winchelsea Beach, which are all situated within Flood Zone 3a. Expansive areas of the Romney Marshes are situated within Flood Zones 2 and 3 due to a risk of fluvial and tidal flooding.	See Section 7	Mapping shows a relatively low surface water flood risk within the Eastern Rother Ward. Localised areas of surface water flooding are identified around the undeveloped Romney marshland surrounding Rye Harbour, Camber and Pett Level. More significant areas of ponding are predicted in open areas surrounding the Panel Sewer and the River Brede in the south east of the ward and the River Rother in the north.	✓	✓	✓	✓	✓	Inundation from the Powdermill Reservoir, may affect areas of River Brede floodplain in the south west of the ward.
Ewhurst and Sedlescombe	Ewhurst and Sedlescombe ward is bounded to the north by the River Rother and the south by the River Brede. Areas of fluvial flood risk, situated in Flood Zone 3b, are identified near Sedlescombe and Bodiam. However, risk	See Section 7	Surface water flow paths correlate to the hydrological flow paths of the River Rother, River Brede and River Tillingham networks. Predicted ponding of surface water is identified in open areas	✓	✓	✓	✓	✓	Inundation from the Darwell Reservoir, located to the east of the ward, may affect areas of Bodiam. A small area east of

	Fluvial/tidal/coastal flood risk	Formal flood defences	Surface water flood risk	Susceptibility to groundwater flooding, according to JBA map					Reservoir inundation
				No risk	5m below surface	0.5m to 5m below the surface	0.025m to 0.5m below surface	Within 0.025m of surface	
	is generally restricted to the open floodplain surrounding the watercourses.		surrounding these networks and south of the railway line.						Sedlescombe is at risk of flooding from the Powdermill Reservoir.
Kewhurst	The majority of Kewhurst ward is located within Flood Zone 1. A small area around Downlands Avenue and Little Common Road is at a fluvial flood risk from Egerton Stream, situated within Flood Zone 2.	See Section 7	Mapping shows a significant area of surface water ponding immediately south of Bexhill Down. Surface water originates from three surface water paths that flow from north to south down Combe Valley Way, Warwick Road and West Down Road. A high-risk surface water flow path is also identified along Westcourt Drive which flows out of the ward in a southerly direction.	✓					None
Marsham	Marsham ward is at a risk of flooding from a combination of fluvial, tidal and coastal sources. The ward is bounded to the north by the River Brede and to the east by Marsham Sewer and the English Channel. Flood Zones 2 and 3 are generally restricted to areas of Romney marshland and floodplain on the south bank of the River Brede, although a small number of properties at Cliff End are at risk of coastal/ tidal flooding, located within Flood Zone 3a.	See Section 7	Marsham has a network of surface water flow paths that flow south to north, following surface topography and the drainage network of the River Brede, Marsham Sewer, the Royal Military Canal. Expansive areas of ponding occur in the marshland areas surrounding Pett Level and on the floodplains north of Doleham.	✓	✓	✓	✓	✓	Inundation from the Powdermill Reservoir, to the north east of the ward may cause flooding of northern areas of River Brede floodplain.
Old Town	Old Town ward is at a very low risk of flooding from fluvial, coastal or tidal sources, located predominantly within Flood Zone 1. A very small area surrounding Pebsham Stream in the north east is located within Flood Zone 3a.	See Section 7	Mapping demonstrates two main surface water routes which both flowing out of the ward. High surface water flood risk is predicted along Church Vale Road, Chantry Avenue and St Peter's Crescent flowing from east to west. Surface water is also mapped flowing west to east along the topological pathway of Pebsham Stream.	✓					None
Rother Levels	The Rother Levels ward is bounded to the north by the River Rother and to the south by the River Tillingham. Fluvial flood risk is generally restricted to floodplains on the banks of these watercourses, as well as on open land surrounding a number of smaller tributaries.	See Section 7	Mapping shows vast areas of high surface water flood risk that follow surface topography and correspond to the drainage network of the River Rother in the north and the River Tillingham in the south. Ponding of surface water is predicted on the open floodplains surrounding the channels.	✓	✓	✓	✓	✓	Inundation from the Darwell Reservoir may affect areas located on the River Rother floodplain, including Robertsbridge.
Rye	Rye is at a significant risk of flooding from fluvial and tidal sources. High risk areas include Tilling Green, Rye College and Sports Centre and North Salts, which are all located within Flood Zone 3a. The area of open farmland, immediately south of Rye town centre is situated within Flood Zone 3b.	See Section 7	Areas of high surface water flood risk are shown across the town of Rye. Particular high-risk areas include Tilling Green, where surface water flood risk largely follows roads such as Mason Road and Cooper Road, as well as the area surrounding Rye College and the railway station car park. Ponding occurs on land situated between Military Road and the River Rother, creating risk to residential properties along North Salts.	✓	✓	✓	✓	✓	None
Sackville	Sackville ward is located on the coast. A small strip of land south of De La Warr Par is at risk of coastal/tidal flooding, situated within Flood Zone 3b.	See Section 7	Mapping shows several surface water paths flowing from north to south, generally following the routes of roads. Significant high-risk flow paths are shown down Dorset Road, College Road and Sutton Place. Ponding is predicted north of the railway line, affecting areas area across the St Richard's Catholic School's Playing fields and the Ravenside Retail and Leisure Park.	✓		✓	✓	✓	None
Salehurst	Salehurst ward has a fluvial flood risk from the River Rother. Areas at risk include parts of Robertsbridge and Salehurst which are located within Flood Zone 3b.	See Section 7	Salehurst is characterised by a band of surface water flood risk through the centre of the ward that correlates to open floodplain surrounding the drainage network of the River Rother. High risk areas include the towns of Robertsbridge and Salehurst.	✓	✓	✓	✓	✓	Inundation from the Darwell Reservoir may affect widespread areas of the ward, including Robertsbridge and Salehurst.
Sidley	Sidley ward is bounded to the north by Combe Haven and Watermill Stream. Small areas of fluvial flood risk, within Flood Zones 2 and 3, are identified on open	See Section 7	Mapping identifies a number of roads in Sidley at a high risk of surface water flooding, including Combe Valley Way, Ninfield Road and Turkey Road. Surface	✓	✓	✓	✓	✓	None

	Fluvial/tidal/coastal flood risk	Formal flood defences	Surface water flood risk	Susceptibility to groundwater flooding, according to JBA map					Reservoir inundation
				No risk	5m below surface	0.5m to 5m below the surface	0.025m to 0.5m below surface	Within 0.025m of surface	
	floodplain to the south of these watercourses, however the majority of the ward is located within Flood Zone 1.		water flooding in the rest of the ward is limited to the hydrological networks of Watermill Stream and Combe Haven.						
St Marks	St Marks ward is at a fluvial/ tidal flood risk from Picknell Green Stream and the Pevensey Levels and a coastal/tidal flood risk from the English Channel. This flood risk is predominantly located in the south east of the ward across the expansive low lying area of Pevensey Marshes, which are situated within Flood Zone 3a. However, a small number of properties in Little Common and Cooden Beach are at risk of flooding from Picknell Green Stream and the sea, respectively.	See Section 7	Mapping shows that the main areas of surface water flood risk are located across the Pevensey Marshes or on floodplains surrounding Picknell Green Stream. High risk settlements include Cooden and Little Common.	✓		✓	✓	✓	None
St Michaels	There is a fluvial/ tidal flood risk within St Michaels ward from Combe Haven and Pebsham Stream. Flood zones 2 and 3 are restricted to open land surrounding these watercourses.	See Section 7	Mapping shows two predominant flow pathways from west to east. Flows follow surface topography and the river network of Pebsham Stream. An expansive area of ponding is located in the north of the ward on low-lying floodplains surrounding Combe Valley.	✓			✓		None
St Stephens	St Stephens ward is at a very low risk of flooding from fluvial, coastal or tidal sources and is predominantly situated within Flood Zone 1. A small area surrounding Bexhill Leisure centre is at risk of fluvial flooding from Egerton Stream and falls within Flood Zone 2.	See Section 7	Areas of high surface water flood risk are identified to follow routes of roads and drainage networks in the ward. High risk areas include Woodsgate Park, Dalehurst Road and the area surrounding King Offa Academy.	✓					None
Ticehurst and Etchingham	Ticehurst and Etchingham ward contain areas of fluvial flood risk from the River Rother in the south and the River Bewl in the north. Flood zones 2 and 3 are generally restricted to open land surrounding these watercourses, although a small number of properties in Etchingham are located within Flood Zone 3b.	See Section 7	Mapping shows extensive areas of surface water flood risk that follow surface topography and corelate to vast floodplains surrounding the River Rother drainage network. The towns of Ticehurst and Etchingham are both predicted to be at a high risk of surface water flooding. Ponding is predicted in southern sections of Bewl Water Reservoir.	✓		✓	✓	✓	Inundation from the Darwell Reservoir may affect areas in the south of the ward located on the River Brede floodplain, such as Etchingham. A small area in the north west of the ward is at risk of flooding from Bewl Water.

7 Fluvial, tidal and coastal flood defences

This section provides a summary of the existing flood defence assets within the Rother District. Planners should note the areas that are protected by defences where further work to understand the actual and residual flood risk through a Level 2 SFRA may be beneficial. Developers should consider the benefit they provide over the lifetime of a development in a site-specific Flood Risk Assessment. Refer to the SFRA guide to using technical data in Appendix O for recommendations and details on how to apply the Sequential and Exception tests using the data set out in this section.

A high-level review of flood defences was carried out for this SFRA based on the Environment Agency's Spatial Flood Defences dataset, involving an interrogation of existing information on asset condition and standard of protection.

Defences are categorised as either raised defences (e.g. walls/embankments) Flood Storage Areas (FSAs) or channel maintenance. An assessment of the Environment Agency Spatial Flood Defence dataset has been carried out, complimented with the defence dataset derived from the River Brede Fluvial Model (2018). Defences which potentially provide a standard of protection from a 50% AEP event or more have been considered. The datasets include man-made and natural defences which may arise for instance due to the presence of naturally high ground adjacent to a settlement have been considered. The defences and their locations are summarised in the following sections.

7.1 Defence standard of protection

One of the principal aims of this SFRA is to outline the present risk of flooding across the Rother District Local Plan area including consideration of the effect of flood risk management measures (including flood banks and defences). The modelling that informs the understanding of flood risk within the Local Plan area is typically of a catchment wide nature, suitable for preparing evidence on possible site options for development. In cases where a specific site risk assessment is required, detailed studies should seek to refine the results used to provide a strategic understanding of flood risk from all sources. Developers should consider the standard of protection provided by defences when preparing detailed Flood Risk Assessments.

7.1.1 Standard of Protection

Flood defences are designed to give a specific standard of protection, reducing the risk of flooding to people and property in flood prone areas. For example, a flood defence with a 1% AEP standard of protection means that the flood risk in the defended area is reduced to a 1% chance of flooding in any given year.

Although flood defences are designed to a standard of protection it should be noted that, over time, the actual standard of protection provided by the defence may decrease, for example due to deterioration in condition or increases in flood risk due to the increased magnitude of the flood hazard caused by climate change effects (e.g. rise in frequency and intensity of extreme weather over time).

For raised flood defences (bunds or banks), a standard of protection can be straight forward to define. However, sometimes it is not possible to define the standard of protection for Flood Storage Areas as there are a number of factors that determine the protection that they can provide e.g. outflow rates, number of watercourses that flow into the Flood Storage Area.

For the purpose of this study, the standard of protection for defences along the River Brede has been derived from the River Brede model (as the Spatial Flood Defence Dataset does not include the up-to-date defences on the River Brede – this approach was agreed following consultation with representatives from the Environment Agency. For the rest of the defences in Rother District, the standard of protection has been derived from the Environment Agency Spatial Flood Defence Dataset.

It should be noted that planned improvements to the standard of protection provided by the Rother Tidal Walls East and defences at Lydd Ranges had not been completed whilst this SFRA was being carried out. Therefore, some areas of these defences are currently shown by the Environment Agency mapping to offer no standard of protection for the Local Plan area. Once completed it is expected that these defences will provide a 0.5% AEP standard of protection from the sea in any given year. Therefore, it is recommended that developers refer to the most up to date Spatial Flood Defence dataset provided by the Environment Agency when preparing Flood Risk Assessments.

7.2 Defence condition

Formal structural defences are given a rating by the Environment Agency based on a grading system for their condition[8]. A summary of the grading system used by the Environment Agency for condition is provided in Table 7-1.

Table 7-1:Defence asset condition rating

Grade	Rating	Description
1	Very Good	Cosmetic defects that will have no effect on performance.
2	Good	Minor defects that will not reduce the overall performance of the asset.
3	Fair	Defects that could reduce the performance of the asset.
4	Poor	Defects that would significantly reduce the performance of the asset. Further investigation required.
5	Very Poor	Severe defects resulting in complete performance failure.

For the defences that have been derived from the River Brede model, instead of the Environment Agency dataset, their condition remains unknown. This is due to there being no asset condition information provided within the model.

The condition of existing flood defences and whether they are planned to be maintained and/or improved in the future must be considered with respect to the safety and sustainability of development over its intended life and also with respect to the financial and economic commitment to the long-term provision of appropriate standards of protection. In some cases, the relevant strategy may suggest that it is not appropriate to maintain the condition of the assets, which may prove influential for the development over its intended life. In addition, detailed FRAs undertaken by developers (if a defence is influential to the proposed development) will need to thoroughly explore the condition of defences, especially where these defences are informal and demonstrate a wide variation of condition grades. It is important that

8 Condition Assessment Manual, Environment Agency (2012)

all of these assets are maintained to a good condition and their function remains unimpaired in accordance with the policy and strategy for Flood Risk Management.

7.3 Coastal, tidal and fluvial defences in the Local Plan area

All main rivers in the Rother District have fluvial defences along their lengths, including defence provided by the presence of natural high ground. The River Rother also has tidal defences in place, stretching from the coastline to Star Lock House. Tidal fluvial defences are situated along the reach of the River Rother between Rye Harbour and the English Channel and in the lower catchment of the River Brede. The types of these defences largely consist of embankments and areas of high ground. The majority of the coastline in Rother District is protected by coastal defences which include beaches, dunes, cliffs and flood walls.

When considering defences along the coastline, it is important to differentiate between those which are constructed to protect the coastal frontage from erosion and those which are designed to protect the coast from flood risk from the tide levels in the sea e.g. still water levels exceeding the defence crest, or waves overtopping the defence. Each of these types of defence are present in the Rother District Local Plan area but are not designed to necessarily fulfil the dual purpose of managing flood risk and coastal protection. However, with climate change, it is likely that many of locations with coastal defences will need to include provision for tidal defence in the future if standards of protection are to be maintained.

The majority of defences in Rother District provide a standard of protection between 20% and 50% AEP. This is because there are a range of different defences in the Environment Agency dataset including "high ground" which can be the natural ground level, as a result may defences have a relatively low standard of protection. However, there are several defences that offer a greater standard of protection up to 0.25% AEP. Most of these are located along the coastline and the tidal reach of the River Romney, as a result of improvements to flood defences carried out following plans identified in the **Folkestone to Cliff End Flood Risk Management Strategy**. The Environment Agency defence data shows that most defences within the Local Plan area are in a 'Very good', 'Good' or 'Fair' condition.

The maps shown in Appendix J.1, J.2, J.3 and J.4 provide a summary of the defences with a standard of protection against a 50% AEP event or greater in the Local Plan area. Mapping includes the defence location, type, condition and standard of protection, using the spatial defence data provided by the Environment Agency and defence data derived from the River Brede Model. The Reduction in Risk of Flooding from Rivers and Sea due to Defences dataset is shown in Appendix K, and demonstrates areas in the Rother district that have reduced flood risk from rivers and sea due to the presence of flood defences during a 1% AEP fluvial event or 0.5% AEP tidal event. Where the Standard of Protection of a defence is less than 1% (i.e. the defence is only able to protect the land behind it from a 50% AEP event) the flood risk will not be shown within the Reduction in Risk of Flooding from Rivers and Sea due to Defences dataset.

Additional flood risk management structures have been identified within IDB areas. These are drainage structures, predominately consisting of pumping stations and outfalls. A further map identifying the locations of these IDB flood risk management structures in relation to the Environment Agency owned flood defences is included in Appendix J.5.

The defences shown within Appendix J show the locations where defences protect against flood risk only, as a result there may be some areas which are protected against coastal erosion (e.g. Bexhill) which are not shown on the mapping.

7.3.1 Flood Alleviation Schemes

There are a number of alleviations schemes within the Local Plan area.

Within Rother District, the Environment Agency has recently completed construction of the Pett Level coastal defence scheme (completed in 2007), the Rother Tidal Walls West (completed in 2015) and the Broomhill Sands coastal defence scheme (completed in 2015). These schemes were set out under the **Folkestone to Cliff End Flood Risk Management Strategy** to provide improvements to flood defences along the Romney Marsh Coastline. The strategy involves the update of flood defences nearing the end of their design life, to a greater standard of protection of 0.5% AEP (based on data at the time of design) over the next 100-year period. The Environment Agency is currently completing improvement works to the Lydd Ranges coastal defences, which began in April 2021.

Fluvial flood alleviation schemes within the Local Plan area include the Robertsbridge Flood Alleviation Scheme, implemented following the autumn 2000 floods. The scheme was completed in 2004 and involved the raising of flood walls and embankments and the implementation of several demountable flood defences and pumps to drain water landward of the defences back into the river. The defences which are maintained by the Environment Agency, were designed to provide a standard of protection of 1% AEP.

The Rother Area Drainage Improvements Scheme (RADIS) was completed in the 1960's, consisting of raised earth embankments and 23 pumping stations in the catchment areas of the River Rother, Brede and Tillingham. The scheme enabled more sustainable food production and is thought to have benefitted 23,800 acres of land. The Rother Wet Levels were designed to flood to provide floodplain storage during the periods of highest flows.

There are no Flood Storage Areas recorded in the Local Plan area in the Environment Agency's 'Flood Map for Planning – Flood Storage Areas' dataset.

7.4 Proposed coastal, tidal and fluvial defences in the Local Plan area

Rother Tidal Walls (East)- this scheme will provide a 1 in 200 year standard of protection for the community in East Rye and Guldeford. Planned improvements to these defences comprise of raising and strengthening the existing embankments, as well as the construction of a flood wall. The scheme was scheduled to start in 2022 and is still ongoing.

Lydd Ranges – the scheme will provide a 1 in 200 year Standard of Protection between Jury's Gap and Denge Outfall. This work began in April 2021 and forms part of the wider **Folkestone to Cliff End Strategy**. The ongoing work involves:

- installation of 1.8km groyne field east of Jury's Gap and recharging of shingle at this section of the beach
- a further 5.6km of frontage will be left open to coastal process, although some shingle re-profiling may be required
- improvement of the existing track (the Green Wall) and relocation of an existing outfall at Denge, inland
- periodic shingle recharge at the groyne filed once the scheme is completed, as well as the occasional work to repair storm damage.

7.5 Southern Water- Pathfinder project

Southern Water's Pathfinder project in Fairlight, East Sussex, aims to reduce the risk of flooding in the village and reduce the risk of storm overflows. This project involves:

- Understanding the network- conducting surveys and investigations to understand the sewer network in the area
- Working alongside local representatives and community groups for collaborative working
- Optimising infrastructure- investing in and optimising current water infrastructure to help manage excess amounts of surface water during periods of heavy rainfall
- Surface water management- includes working alongside the local council to improve highway drainage, as well as with local residents to slow the flow of surface water into the sewer through the use of slow-drain water butts

7.6 Residual flood risk

Residual risks are those remaining after applying the sequential approach and taking mitigating actions. The residual risk can be:

- the effects of a flood with a magnitude greater than that for which the defences or management measures have been designed to alleviate (the '**design flood**'). This can result in overtopping of flood banks, failure of flood gates to cope with the level of flow or failure of pumping systems to cope with the incoming discharges; and/or
- failure of defences or flood risk management measures to perform their intended duty. This could be breach or failure of flood embankments, failure of flood gates to operate in the intended manner, or failure of pumping stations.

In circumstances where measures are put in place to manage flood risk, there remains a possibility of flooding being experienced, either as a consequence of the event exceeding the design capacity or the failure of the asset providing the appropriate standard of protection. Significant changes to sea level rise projections over the lifetime of a development will also result in residual risk. It is the responsibility of the developer to fully assess flood risk, propose measures to mitigate it and demonstrate that any residual risks can be safely managed.

This SFRA does not assess the probability of failure other than noting that such events are very rare. However, in accordance with NPPF, all sources of flooding need to be considered. If a breach or overtopping event were to occur, then the consequences to people and property could be high. Developers should be aware that any site that is at or below defence level may be subject to flooding if an event occurs that exceeds the design capacity of the defences, or the defences fail, and this should be considered in a detailed Flood Risk Assessment. The assessment of residual risk should take into account:

- The flood hazard, depth and velocity that would result from overtopping or breach of defences. Flood gate or pumping station failure and/ or culvert blockage (as appropriate). The Environment Agency can provide advice at site-specific development level for advice on breach/ overtopping parameters for flood models.
- The design of the development to take account of the highest risk parts of the site e.g. allowing for flood storage on parts of the site and considering the design of the development to keep people safe e.g. sleeping accommodation above the flood level.

- A system of warning and a safe means of access and egress from the site in the event of a flood for users of the site and emergency services.

7.6.1 Overtopping

In exposed locations along the coast, landward flooding is more likely to occur as a consequence of wave overtopping than inundation. See Section 6.7.1 for details of wave overtopping.

The risk from overtopping of defences is based on the relative heights of property or defence, the distance from the defence level and the height of water above the crest level of the defence. The Defra and Environment Agency **Flood Risks to People** guidance document provides standard flood hazard ratings based on the distance from the defence and the level of overtopping.

The risk of waves overtopping sea walls in particular can lead to a significant flood hazard. As part of this SFRA, the effect of wave overtopping along the coastline has been included in the Flood Zone 3b delineation.

7.6.2 Defence breach

A breach of a defence occurs when there is a failure in the structure and a subsequent ingress of flood water.

Where defences are present, risk of breach events should be considered as part of the site-specific flood risk assessment. Flood flows from breach events can be associated with significant depths and flow velocities in the immediate vicinity of the breach location and so FRAs must include assessment of the hazards that might be present so that the safety of people and structural stability of properties and infrastructure can be appropriately taken into account. Whilst the area in the immediate vicinity of a breach can be subject to high flows, the whole flood risk area associated with a breach must also be considered as there may be areas remote from the breach that might, due to topography, involve increased depth hazards.

8 FRA requirements and flood risk management guidance

This section provides guidance on site-specific Flood Risk Assessments (FRAs). These are carried out by (or on behalf of) developers to assess flood risk to and from a site. They are submitted with Planning Applications and should demonstrate how flood risk will be managed over the development's lifetime, considering climate change and vulnerability of users.

8.1 Over-arching principles

This SFRA focuses on delivering a strategic assessment of flood risk within the study area. Prior to any construction or development, site-specific FRAs will need to be undertaken as set out in the NPPF (see 3.1) to assess all sources of flood risk.

Some sites may additionally require the application of the Exception Test following the Sequential Test if there are safety and sustainability issues to be addressed. If the Exception Test is applied, it must be informed by a detailed FRA to ensure it is safe and will not increase flooding elsewhere. Any site that does not pass the Exception Test should not normally be allocated or permitted for development. It is the responsibility of the developer to provide an FRA with an application.

It should be acknowledged that a detailed FRA may show that a site is not appropriate for development of a particular vulnerability or even at all. Where the FRA shows that a site is not appropriate for a particular use, a lower vulnerability classification may be appropriate.

8.2 Requirements for site-specific flood risk assessments

Paragraph 080 of the Planning Practice Guidance - Flood Risk and Coastal Change, sets out a checklist for developers to assist with site specific flood risk assessments.

Site specific FRAs are required in the following circumstances:

- Proposals for new development (including minor development such as non-residential extensions, alterations which do not increase the size of the building or householder developments and change of use) in Flood Zones 2 and 3
- Proposals for new development (including minor development and change of use) in an area within Flood Zone 1 which has critical drainage problems (as notified to the LPA by the Environment Agency)
- Proposals of one hectare or greater in Flood Zone 1
- Where proposed development or a change of use to a more vulnerable class may be subject to other sources of flooding
- Proposals within Flood Zone 1 where the LPA's strategic flood risk assessment (SFRA) shows it will be at increased risk of flooding during its lifetime

An FRA may also be required for some specific situations:

- If the site may be at risk from the breach of a local defence (even if the site is actually in Flood Zone 1)
- Where the site is intended to discharge to the catchment or assets of a water management authority (e.g. Romney Marshes Area and Pevensey and Cuckmere Water Level Management Board) which requires a site-specific FRA

- Where evidence of historical or recent flood events have been passed to the LPA
- On land in the vicinity of small watercourses or drainage features that might not have been demarcated as being in a Flood Zone on the national mapping
- At locations where proposals could affect or be affected by substantial overland surface water flow routes.

8.2.1 Objectives of site specific FRAs

The aim of an FRA is to demonstrate that the development is safe for its intended life span during the '**design flood**' event, including an allowance for climate change and does not impact on flood risk elsewhere. This includes assessment of mitigation measures required to safely manage flood risk. Development proposals requiring FRAs should establish:

- whether a proposed development is likely to be affected by current or future flooding from any source;
- whether a proposed development will increase flood risk elsewhere over the lifetime of the development;
- whether the measures proposed to deal with the effects and risks are appropriate;
- the potential cumulative impact of development on flood risk;
- how surface water runoff from the site will be managed (see section 9);
- the evidence, if necessary, for the Local Planning Authority to apply the Sequential Test; and
- whether, if applicable, the development will be safe and pass the Exception Test.

FRAs for sites located in the Local Plan area should follow the approach recommended by the NPPF (and associated guidance) and guidance provided by the Environment Agency and East Sussex County Council. This includes:

- **Site-specific Flood Risk Assessment: Checklist** (NPPF PPG, Defra)
- **Standing Advice on Flood Risk** (Environment Agency)
- **Flood Risk Assessment for Planning Applications** (Environment Agency)
- **Guide to Sustainable Drainage Systems in East Sussex-** (East Sussex County Council's **Sustainable Drainage Systems** webpage)

When undertaking an FRA, developers should refer to the most up to date climate change allowances as provided by the Environment Agency. More information on the updated climate change allowances, based on the UKCP18 projections, is available in Section 4.3. Developers are encouraged to seek planning advice from the Environment Agency at pre-application stages. By making an allowance for climate change it will help reduce the vulnerability of the development and provide resilience to flooding in the future.

Due to the complexity of projecting the effects of climate change, there are uncertainties attributed to climate change allowances. As a result, the guidance presents a range of possibilities to reflect the potential variation in the impact of climate change over three periods.

Guidance for local planning authorities for reviewing flood risk assessments submitted as part of planning applications has been published by Defra in 2015 – **Flood Risk Assessment: Local Planning Authorities**.

8.3 Mitigation measures

Mitigation measures should be regarded as a last resort to address flood risk issues where the site has passed the Exception Test and therefore has strong planning/sustainability reasons for development. Consideration should first be given to minimising risk by planning sequentially, through careful design and layout, across a site. Once risk has been minimised as far as possible, only then should mitigation measures be considered.

Often the determining factors in deciding whether a particular development is appropriate are the practical feasibility, financial viability and long-term maintenance implications of flood risk mitigation rather than technical limitations. Detailed technical assessments are required in the FRA to assess the practical feasibility, together with a commercial review by the developer of the cost of the mitigation works and how contributions will be made for their long-term maintenance. At the SFRA stage, broad assumptions must be made regarding the feasibility of flood risk mitigation to highlight sites with greater development potential. The formulation of measures that not only provide an appropriate standard of protection to new development, but also reduce the risk to existing communities will be an important consideration.

Attention must also be paid to the provision of safe access and egress during flood events, including climate change, and how this is linked to flood warning and emergency evacuation where necessary. The Emergency Services and local authority should be consulted on the evacuation and rescue capabilities and any advice or requirements included. Consideration should also be given to residual risk to understand the safety implications during events where the design capacity is exceeded or there is a failure.

There should normally be no interruption to flood flows or loss of flood storage as a result of any proposed development. Flood storage compensation may be appropriate for sites on the edge of the existing floodplain or within another, hydraulically linked, part of the flood plain (flood cell). Resilience rather than resistance measures should be used if floodplain compensation is not being provided.

Whilst it might be possible to identify appropriate flood mitigation measures for some sites, it is worth noting that in some instances the findings of individual FRAs may determine that the risk of flooding to a proposed development is too great and mitigation measures are not feasible or appropriate.

The minimum acceptable standard of protection against flooding for new residential property within flood risk areas is the 1% AEP event plus climate change for fluvial and surface water flooding, and 0.5% AEP plus climate change event for tidal flooding. Developments susceptible to flood risk resulting from blockage or exceedance of structures should be protected beyond the 1% AEP plus climate change scenario. An allowance for climate change over the lifetime of the development must be made when assessing each of these scenarios and be conducted in line with latest guidance for climate change.

8.4 Reducing flood risk

8.4.1 Site layout and design

Flood risk from all sources should be considered at an early stage in deciding the layout and design of a site to provide an opportunity to reduce flood risk within the development.

Guidance on the best practice design is available in the **Construction Industry Research and Information Association (CIRIA) SuDS Manual C753 (2015)**

The NPPF states that the sequential approach to layout needs to consider all sources of flood risk. Therefore, a sequential, risk-based approach should be applied to try to locate more vulnerable land use away from areas of high flood risk , while more flood-compatible development (e.g. vehicular parking, recreational space) can be located in higher risk areas. However, vehicular parking in floodplains should consider the nature of parking, flood depths and hazard including evacuation procedures and flood warning. The nature of risk to water quality also needs to be considered and mitigated to ensure that accumulated hydrocarbons and other vehicle related pollutants are not released to the aquatic environment.

Waterside areas, or areas along known flow routes, can be incorporated into the masterplan as multi-functional green infrastructure, being used for recreation, amenity and environmental purposes, allowing the preservation of flow routes and flood storage, and at the same time providing valuable social and environmental benefits contributing to other sustainability objectives. Landscaping should ensure safe access to higher ground from these areas and avoid the creation of isolated islands as water levels rise.

8.4.2 Raised floor levels

When designing the layout for a development, consideration should be given to the potential effects of flood risk and great care should be taken so that development is safe and there are no adverse effects on existing land, property or people. In areas potentially at risk from surface water flooding particular attention should be given to proposed ground levels, drainage design and provisions for exceedance flows. Where there is a residual risk of flooding (from any source) to properties within a development the measures to address the effects would normally include raising internal floor levels above the minimum level specified by the building regulations so that potential risks are addressed. The raising of internal floor levels and threshold levels within a development reduces the risk of damage occurring to the interior, furnishings and electrics in times of flood.

Minimum finished floor levels for development that does not include sleeping accommodation on the ground floor should normally be set to whichever is higher of 600mm above the:

- Average ground level of the site
- Adjacent road level to the buildings
- Estimated river or sea flood level for the site.

Where there is a high level of certainty about the estimated flood level, it may be appropriate to reduce this to 300mm. If there is a particularly high level of uncertainty it may need to be increased.

The estimated flood level is defined as follows:

- river flood with a 1% annual probability - a 1 in 100 chance each year plus an allowance for climate change
- tidal flood with a 0.5% annual probability - a 1 in 200 chance each year plus an allowance for climate change

If it is not practical to raise floor levels to those specified above, you will need to:

- raise them as much as possible
- consider moving vulnerable uses to upper floors
- include extra flood resistance and resilience measures

The additional height that the floor level is raised above the maximum water level is referred to as the "freeboard". Additional freeboard may be required because of risks relating to blockages to the channel, culverts or bridges. These should be considered as part of a site specific Flood Risk Assessment.

Allocating the ground floor of a building for less vulnerable, non-residential, use is an effective way of raising living space above flood levels.

Part H of buildings regulations recommends that finished floor levels (FFL) and openings (e.g. air bricks) of new developments are set to a minim of 150mm above the surrounding ground levels. This is to prevent flooding from flowing or ponding storm water near doorways and other ingress routes such as vents and air bricks.

If it is not practical (for example where level for level flood plain compensation cannot be provided) to raise floor levels to those specified above, consultation with the Environment Agency will be required to determine whether alternative approaches are appropriate.

Safe access and egress will need to be demonstrated at all development sites. Emergency vehicular access (no more than 300mm depth along access routes) should be possible during times of flood.

Single storey buildings such as ground floor flats or bungalows are especially vulnerable to rapid rise of water (such as that experienced during a breach). This risk can be reduced by use of multiple storey construction and raised areas that provide an escape route. However, access and egress can still be an issue, particularly when flood duration covers many days.

Similarly, the use of basements should be avoided. Habitable uses of basements within Flood Zone 3 should not be permitted, whilst basement dwellings in Flood Zone 2 will be required to pass the Exception Test. Basements should not be used for sleeping arrangements and access should be situated 300mm above the design flood level and waterproof construction techniques used.

8.4.3 Development and raised defences

Construction of localised raised floodwalls or embankments to protect new development is not a preferred option, unless wider benefits can be provided (for example by mitigating risks downstream), as a residual risk of flooding will remain if they are overtopped or breached. Compensatory storage must be provided where raised defences remove storage from the floodplain and exceedance would need to be considered. It would be preferable for schemes to involve an integrated flood risk management solution.

Temporary or demountable defences are not acceptable forms of flood protection for a new development but might be appropriate to address circumstances where the consequences of residual risk are severe. In addition to the technical measures the proposals must include details of how the temporary measures will be erected and decommissioned, the associated temporary floodplain compensation, responsibility for maintenance and the cost of replacement when they deteriorate.

8.4.4 Modification of ground levels

Modifying ground levels to raise the land above the required flood level is an effective way of reducing flood risk to a particular site in circumstances where the land does not act as conveyance for flood waters. However, care must be taken at locations where raising ground levels could adversely affect existing communities and property as this can result in significant changes to how surface water moves around the site, introducing flood risk to areas that were not at flood risk previously. Where ground levels are modified, mitigation measures should be considered to stop the introduction of new flood risk. In most areas of fluvial flood risk, raising land above

the floodplain would reduce conveyance or flood storage in the floodplain and could adversely impact flood risk downstream or on neighbouring land.

Compensatory flood storage should be provided, and would normally be on a level for level, volume for volume basis on land that does not currently flood but is adjacent to the floodplain (in order for it to fill and drain). It should be in the vicinity of the site and within the red line of the planning application boundary.

Raising levels can also create areas where surface water might pond during significant rainfall events or where groundwater flow paths are obstructed. Any proposals to raise ground levels should be tested to ensure that it would not cause increased ponding or build-up of surface runoff on third party land.

Ground level alterations may also cause groundwater flooding. Therefore, any lowering of land is prohibited in areas where groundwater levels are shown to be less than 3m below ground level.

Any proposal for modification of ground levels will need to be discussed at an early stage with the Environment Agency and its impacts assessed as part of a detailed FRA. Additionally, any proposed changes to site levels are discussed with ESSC as LLFA at the master planning stage.

8.4.5 Developer contributions

In some cases, and following the application of the Sequential Test, it may be appropriate for the developer to contribute to the improvement of flood defence provision that would benefit both proposed new development and the existing local community. Developer contributions can also be made to maintenance and provision of flood risk management assets, flood warning and the reduction of surface water flooding (i.e. SuDS).

For strategic flood defence schemes, contributions towards them could be raised through the Community Infrastructure Levy (CIL). CIL was introduced in Rother in 2016 and allows the local authority to raise funds from developers undertaking new building projects. The money raised is used to fund a wide range of infrastructure projects needed to support development in the locality.

Alternatively, for more localised schemes a Section 106 agreement could be sought. These are a mechanism which make a development proposal acceptable in planning terms, that would otherwise not be acceptable.

Rother District Council may work in conjunction with the Environment Agency and East Sussex County Council as the LLFA to identify locations where strategic or local schemes may be appropriate. Developers are encouraged to seek pre-application advice from Rother District Council and other relevant authorities (the EA, LLFA and IDBs) in order to assess the likely extent of any requirements.

DEFRA's Flood and Coastal Erosion Risk Management Grant in Aid (FCERM GiA)[9] can be obtained by operating authorities to contribute towards the cost of a range of activities including flood risk management schemes that help reduce the risk of flooding and coastal erosion. Some schemes are only partly funded by FCERM GiA and therefore any shortfall in funds will need to be found from elsewhere when using Resilience Partnership Funding, for example local levy funding, local businesses or other parties benefitting from the scheme.

For new development in locations without existing defences, or where the development is the only beneficiary, the full costs of appropriate risk management measures for the life of the assets proposed must be funded by the developer.

9 Principles for implementing flood and coastal resilience funding partnerships (Environment Agency, 2012)

However, the provision of funding by a developer for the cost of the necessary standard of protection from flooding or coastal erosion does not mean the development is appropriate as other policy aims must also be met. This will include application of the NPPF Sequential, and as necessary, Exception Tests. Funding from developers should be explored prior to the granting of planning permission and in partnership with the council and the Environment Agency.

The appropriate route for the consideration of strategic measures to address flood risk issues is discussed in more detail in Section 11. Developers must be able to demonstrate that any strategic provisions can be afforded and have an appropriate priority.

The Environment Agency is also committed to working in partnership with developers to reduce flood risk. Where assets are in need of improvement or a scheme can be implemented to reduce flood risk, the Environment Agency request that developers contact them to discuss potential solutions.

8.5 Buffer strips

The provision of a buffer strip to 'make space for water', allows additional capacity to accommodate climate change and ensure access to the watercourse, structures and defences is maintained for future maintenance purposes. It also enables the avoidance of disturbing riverbanks, adversely impacting ecology and having to construct engineered riverbank protection. Building adjacent to riverbanks can also cause problems to the structural integrity of the riverbanks and the building itself, making future maintenance of the river much more difficult.

Various buffer strip Byelaws are in place within Rother District. Under the **Environmental Permitting (England and Wales) Regulations 2016**, the Environment Agency specifies that no development is permitted within 8m either side of a Main River or within 15m of the foot of the landward side of any sea defences or between the low water mark of medium tides and the seaward side of any sea defence. No byelaws are in in place for ordinary watercourses outside of IDB areas, however the provision for a buffer zone is expected by the LLFA, it is recommended that this is the same as those of Main Rivers.

Under the **Romney Marshes Area Internal Drainage Board Byelaws**, no development is permitted within 8m of any Ordinary Watercourse, within the Boards District and maintained by the Board. Lastly, under the **Pevensey and Cuckmere Water Level Management Board Byelaws**, no works are allowed within 9m of the edge of any drainage or flood risk management infrastructure (including ordinary watercourses) within the Boards district and maintained by the Board.

Appendix L shows the buffer areas for different watercourses within Rother District. This map should be consulted when allocating new development.

8.6 Resistance and Resilience measures

There may be instances where flood risk to a development remains despite implementation of such planning measures as those outlined above. For example, where the use is water compatible, where an existing building is being changed, where residual risk remains behind defences, or where floor levels have been raised but there is still a risk at the 0.1% AEP scenario. In these cases, (and for existing development in the floodplain), additional measures can be put in place to reduce damage in a flood and increase the speed of recovery. These measures should not normally be relied on for new development as an appropriate mitigation method.

Resistance measures aim to reduce the amount of floodwater entering the building and resilience measures aim to reduce the damage caused by flood water which has entered the property.

Resistance and Resilience measures will be specific to the nature of flood risk, and as such will be informed and determined by the FRA. Further guidance relating to appropriate resistance and resilience measures can be found at:

- Environment Agency's **Flood risk assessment in flood zones 1, 2 and 3 and 3b** webpage.
- Sussex Resilience Forum provides information and advice for individuals on **Preparing for Emergencies**.

8.6.1 Resistance measures

Resistance measures are suitable for existing development in the floodplain. Most of these measures should be regarded as reducing the rate at which flood water can enter a property during an event and considered an improvement on what could be achieved with sandbags. They are often deployed with small scale pumping equipment to control the flood water that does seep through these systems. The effectiveness of these forms of measures is often dependant on the availability of a reliable forecasting and warning system, so the measures are deployed in advance of an event. The following resistance measures are often deployed:

Permanent barriers

Permanent barriers can include built up doorsteps, rendered brick walls and toughened glass barriers.

Temporary barriers

Temporary barriers consist of moveable flood defences which can be fitted into doorways and/or windows. The permanent fixings required to install these temporary defences should be discrete and keep architectural impact to a minimum. On a smaller scale temporary snap on covers for airbricks and air vents can also be fitted to prevent the entrance of flood water.

As these measures will reduce the storage within the floodplain compensatory storage provision is likely to be required to prevent incremental detriment to the flood risk elsewhere.

8.6.2 Resilience measures

Resilience measures are suitable for new developments where there is a residual flood risk. These measures should be regarded as reducing the impact the flood water has once it has entered a property. These typically include:

Water resistant materials

Floors, walls and fixtures can be finished with water resistant materials to help reduce the damage and greatly shorten the recovery time after a flood. Materials can include waterproof plaster, solid concrete floors and tiled floor coverings.

Electrical installation

Electrical circuitry can be installed at a higher level with power cables being carried down from the ceiling rather than up from the floor level to reduce the likelihood of the circuitry being affected by flood water.

8.6.3 Community resistance measures

Community resistance measures include demountable defences that can be deployed by local communities to reduce the risk of water ingress to a number of properties. The methods require the deployment of inflatable (usually with water) or temporary quick assembly barriers in conjunction with pumps to collect water that seeps through the systems during a flood.

East Sussex County Council works closely with the Sussex Resilience Forum through a Community Resilience Partnership who engage with communities to plan and improve responses and recoveries to emergencies. ESCC has also encouraged the preparation of community emergency plans to help support emergency response arrangements[10]. Local Parish Council's should be contacted to see if a community has an Emergency Plan in place.

8.6.4 Emergency planning

Safe access and egress from the site should be provided to reduce the residual risks to a development. The developer should seek to incorporate an emergency plan and a safe refuge point if the development site has been identified to be at risk of flooding. The local authority and Emergency Services should be consulted when designing an emergency plan. For further details on emergency planning, see Section 10.

8.7 Making space for water

The **PPG** sets out a clear aim in Flood Zone 3 to create space for flooding by restoring functional floodplain and generally development should be directed away from these areas.

All new development close to rivers should consider the opportunity to improve and enhance the river environment. Developments should look at opportunities for river restoration and enhancement as part of the development. Options include backwater creation, de-silting, in-channel habitat enhancement and removal of structures. When designed properly, such measures can have benefits such as reducing the costs of maintaining hard engineering structures, reducing flood risk, improving water quality and increasing biodiversity. Social benefits are also gained by increasing green space and access to the river.

8.8 Reducing flood risk from other sources

8.8.1 Groundwater

Groundwater flooding has a very different flood mechanism to any other and for this reason many conventional flood defence and mitigation methods are not suitable. The only way to fully reduce flood risk would be through building design (development form), ensuring floor levels are raised above the water levels caused by a 1% AEP plus climate change event. Site design would also need to preserve any flow routes followed by the groundwater overland to ensure flood risk is not increased downstream.

Infiltration SuDS can cause increased groundwater levels and subsequently may increase flood risk on or off the site. Developers should provide evidence and ensure that this will not be a significant risk.

When redeveloping existing buildings, it may be acceptable to install pumps in basements as a resilience measure. However, for new development this is not considered an appropriate solution.

8.8.2 Surface water and sewer flooding

Developers should discuss public sewerage capacity with the water utility company (Southern Water) at the earliest possible stage. The development must improve the drainage infrastructure to reduce flood risk on site and the wider area. It is important that a drainage impact assessment shows that this will not increase flood

[10] https://www.eastsussex.gov.uk/media/3379/srfcommunityresponseplanguidancenotesfinal.pdf

risk elsewhere, and that the drainage requirements regarding runoff rates and SuDS for new development are met.

Southern Water's **Surface Water Management Policy** indicates that where a Brownfield site is redeveloped, no historic right of connection will exist, and any sewer connection will be treated as new. The site will be treated as if it was greenfield and therefore discharge rate will be limited to the equivalent 1 in 1 year Greenfield rate.

If residual surface water flood risk remains, the likely flow routes and depths across the site should be modelled. The site should be designed so that these flow routes are preserved and building design should provide resilience against this residual risk.

When redeveloping existing buildings, the installation of some permanent or temporary flood-proofing and resilience measures could protect against both surface water and sewer flooding. Non-return valves prevent water entering the property from drains and sewers. These can be installed within gravity sewers or drains in a property's private sewer upstream of the public sewerage system. They need to be carefully installed and must be regularly maintained. Consideration must also be given to attenuation and flow ensuring that flows during the 1% AEP plus climate change storm event are retained within the site if any flap valves shut. This must be demonstrated with suitable modelling techniques.

8.8.3 Sustainable Drainage Systems

Sustainable Drainage Systems (SuDS) aim to mimic the natural processes of greenfield surface water drainage by encouraging water to flow along natural flow routes and thereby reduce runoff rates and volumes during storm events while providing some water treatment benefits. SuDS also have the advantage of providing effective blue and green infrastructure and ecological and public amenity benefits when designed and maintained properly.

The inclusion of SuDS within developments should be seen as an opportunity to enhance ecological and amenity value, and promote green infrastructure, incorporating above ground facilities into the development landscape strategy. SuDS must be considered at the outset, during preparation of the initial site conceptual layout to ensure that enough land is given to design spaces that will be an asset to the development rather than an after-thought. Advice on best practice is available from the Environment Agency and the Construction Industry Research and Information Association (CIRIA). More detailed guidance on the use of SuDS is providing in Section 9.3.

8.8.4 Cumulative effects

At some locations it will be necessary to include consideration in an FRA of not only the flood risk at a particular site, but also the cumulative effects of all proposed plan allocations within a defined catchment. Reference should be made to Section 12 with respect to the consideration that should be given in these circumstances.

9 Surface water management and SuDS

This chapter provides guidance and advice on managing surface water runoff and flooding. Rother District Council expects the use of SuDS in all new developments, including non-major development.

9.1 Introduction

Sustainable Drainage Systems (SuDS) are management practices which enable surface water to be drained in a more sustainable manner and mimic the local natural drainage. The inclusion of SuDS within developments is an opportunity to enhance ecological and amenity value, and promote Green Infrastructure, incorporating above ground facilities into the development landscape strategy.

East Sussex County Council, as the LLFA, should be consulted on matters relating to surface water management. It is advised that SuDS are used in all new developments, including non-major-development. Guidance on the design and construction of SuDS can be found on **East Sussex County Council's website** and in section 9.5 of this report.

9.2 Role of the LLFA and Local Planning Authority in surface water management

From April 2015, changes to the planning system require that major development should make provision for sustainable drainage systems to manage surface water run-off, where major developments are defined as:

- residential development: 10 dwellings or more, or residential development with a site area of 0.5 hectares or more where the number of dwellings is not yet known;
- non-residential development: provision of a building or buildings where the total floor space to be created is 1,000 square metres or more or, where the floor area is not yet known, a site area of one hectare or more;
- Development carried out on a site having an area of 1 hectare or more; and
- Waste and minerals development

In January 2023, the Government announced their commitment to implement Schedule 3 of the Flood and Water Management Act 2010. Schedule 3 of the Act results in Lead Local Flood Authorities (LLFAs) becoming SuDS Approval Bodies (SABs). SABs would be responsible for approving and adopting drainage systems on new developments, subject to the application of national standards.

Core Strategy Policy EN7, and Policy DEN5 in the DaSA, set out Rother District Council's approach to managing flood risk and the use of Sustainable Drainage Systems at development sites. RDC expects the use of Sustainable Drainage Systems in all new developments, including non-major development. The Local Planning Authority must satisfy themselves that clear arrangements are in place for future management of the maintenance arrangements and the LLFA (East Sussex County Council), as statutory consultee is required to review the drainage and SuDS proposals to confirm they are appropriate. When considering planning applications, Local Planning Authorities should seek advice from the relevant flood risk management bodies, principally the LLFA on the management of surface water (including what sort of SuDS they would consider to be reasonably practicable), satisfy themselves that the proposed minimum standards of operation are

appropriate and ensure, through the use of planning conditions or planning obligations, that there are clear arrangements for on-going maintenance over the development's lifetime. Judgement on what SuDS system would be reasonably practicable should be through reference to Defra's **'Non-statutory technical standards for SuDS' document** and should take into account design and construction costs.

In their respective roles as LLFA and LPA East Sussex County Council and Rother District Councils:

- promote the use of SuDS for the management of run-off;
- ensure their policies and decisions on applications support and compliment the building regulations on sustainable rainwater drainage, giving priority to infiltration over watercourses and then sewer conveyance;
- incorporate favourable policies within development plans;
- adopt policies for incorporating SuDS requirements into Local Plans; and
- encourage developers to utilise SuDS whenever practical, if necessary, through the use of appropriate planning conditions.

9.3 Sustainable Drainage Systems (SuDS)

It is essential that developers consider sustainable drainage at an early stage of the development process – ideally at the design brief or master-planning stage. This will assist with the delivery of well designed, appropriate and effective SuDS. Proposals should also comply with the key SuDS principles (the four pillars of SuDS design - Figure 9-1) enabling solutions that deliver multiple long-term benefits. These principles are:

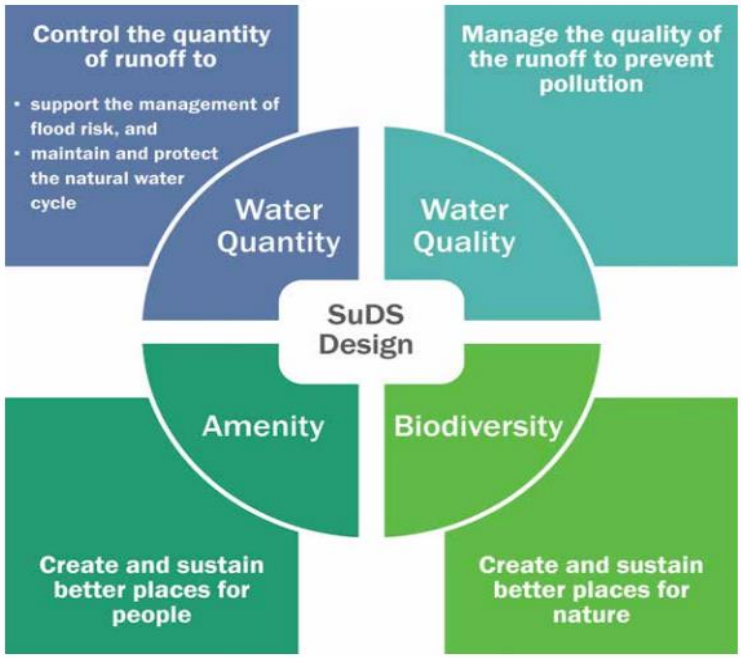
- **Quantity:** should be able to cope with the quantity of water generated by the development at the agreed greenfield rate and volume with due consideration for climate change via a micro-catchment based approach. Where frequency of flood risk, steepness of topography or permeability of geology has a significant impact on the volume or rate of surface water being discharged from a site, the LLFA should be contacted, as a review of the greenfield runoff rate to be achieved may be needed.
- **Quality:** should utilise SuDS features in a "treatment train" that will have the effect of treating the water before infiltration or passing it on to a subsequent water body
- **Amenity:** should integrate greenery or water features to improve the visual characteristics of the area. These can be incorporated within "open space" or "green corridors" within the site and designed with a view to performing a multifunctional purpose.
- **Biodiversity:** should include a range of natural features such as plants, trees and other vegetation which will provide additional filtration of surface water runoff. These can be designed to complement and improve the ecology of the area.

There are a number of ways in which SuDS can be designed to meet surface water quantity, climate change resilience, water quality, biodiversity and amenity goals. Given this flexibility, SuDS are generally capable of overcoming or working alongside various constraints affecting a site, such as restrictions on infiltration, without detriment to achieving these goals.

SuDS must be considered at the outset and during preparation of the initial conceptual site layout to ensure that enough land is given to design spaces that will be an asset to the development as opposed to an ineffective afterthought. For SuDS

to work effectively appropriate techniques should be selected based on the objectives for drainage and the site-specific constraints. It is recommended, that on all developments, source control is implemented as the first stage of a management train allowing for improvements in water quality and reducing or eliminating runoff from smaller, more frequent, rainfall events.

Figure 9-1: Four pillars of SuDS design (from The SuDS Manual C753 (2015))



All new major and non-major development proposals should ensure that sustainable drainage systems for management of run-off are put in place. The developer is responsible for ensuring the design, construction and future/ongoing maintenance of such a scheme are carefully and clearly defined, and a clear and comprehensive understanding of the existing catchment hydrological processes and existing drainage arrangements is essential.

9.4 Types of SuDS System

There are many different SuDS techniques that can be implemented in attempts to mimic pre-development drainage (Table 9-1). Techniques can include soakaways, infiltration trenches, permeable pavements, grassed swales, green roofs, ponds and wetlands and these do not necessarily need to take up a lot of space. The suitability of the techniques will be dictated in part by the development proposal and site conditions. Advice on best practice is available from the Environment Agency and the Construction Industry Research and Information Association (CIRIA) e.g. the **CIRIA SuDS Manual C753 (2015)**.

Table 9-1: Examples of SuDS techniques and potential benefits

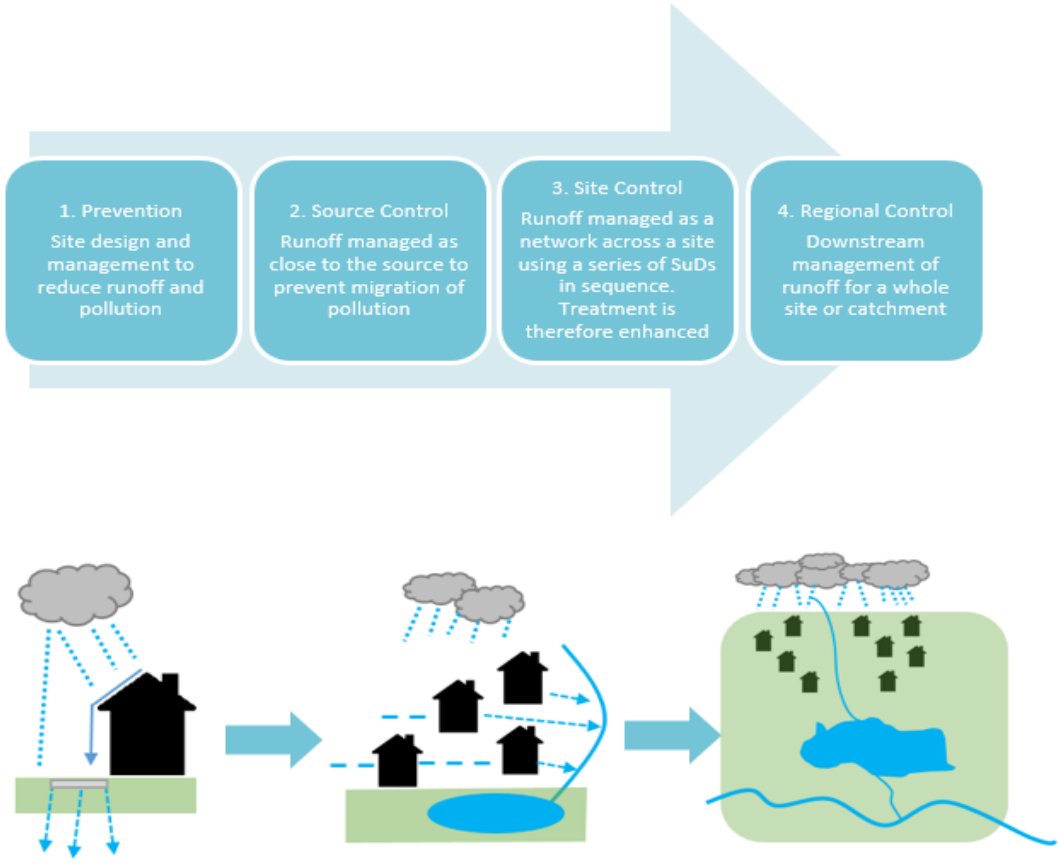
SuDS Technique	Flood Reduction	Water Quality Treatment & Enhancement	Landscape and Wildlife Benefit
Living roofs	✓	✓	✓
Basins and ponds	✓	✓	✓
Constructed wetlands	✓	✓	✓
Balancing ponds	✓	✓	✓
Detention basins	✓	✓	✓
Retention ponds			
Filter strips and swales	✓	✓	✓
Infiltration devices	✓	✓	✓
Soakaways	✓	✓	✓
Infiltration trenches and basins	✓	✓	✓
Permeable surfaces and filter drains	✓	✓	
Gravelled areas	✓	✓	
Solid paving blocks	✓	✓	
Porous pavements	✓	✓	
Tanked systems	✓		
Over-sized pipes/tanks	✓		
Storm cells	✓		

9.4.1 SuDS Management

SuDS should not be used individually but as a series of features in an interconnected system designed to capture water at the source and convey it to a discharge location. Collectively this concept is described as a SuDS Management Train (see Figure 9-2). The number of treatment stages required within the Management Train depends primarily on the source of the runoff and the sensitivity of the groundwater or receiving waterbody. A drainage strategy will need to demonstrate that an appropriate number of treatment stages are delivered to ensure that there is no negative impact on the receiving watercourse.

SuDS components should be selected based on design criteria and how surface water management is to be integrated within the development and landscaping setting. By using a number of SuDS features in series it is possible to reduce the flow and volume of runoff as it passes through the system as well as minimising pollutants which may be generated by a development.

Figure 9-2: SuDS Management Train



9.4.2 Treatment

A key part of the four pillars of SuDS is to provide the maximum improvement to water quality through the use of the "SuDS Management Train". To maximise the treatment within SuDS, CIRIA recommends[11] the following good practice is implemented in the treatment process:

1. **Manage surface water runoff close to source:** This makes treatment easier due to the slower velocities and also helps isolate incidents rather than transport pollutants over a large area.
2. **Treat surface water runoff on the surface:** This allows treatment performance to be more easily inspected and managed. Sources of pollution and potential flood risk is also more easily identified. It also helps with future maintenance work and identifying damaged or failed components.
3. **Treat a range of contaminants:** SuDS should be chosen and designed to deal with the likely contaminants from a development and be able to reduce them to acceptably low levels.

11 C753 CIRIA SuDS Manual (2015)

4. **Minimise the risk of sediment remobilisation:** SuDS should be designed to prevent sediments being washed into receiving water bodies or systems during events greater than what the component may have been designed.
5. **Minimise the impact of spill:** Designing SuDS to be able to trap spills close to the source or provide robust treatment along several components in series.

The number of treatment stages required depends primarily on the source of the runoff. A drainage strategy will need to demonstrate that an appropriate number of treatment stages are delivered. This involves determining a pollutant hazard score for each pollutant type. An index is then used to determine the treatment potential of different SuDS features for different pollutant types. This is known as the mitigation index. The Total SuDS mitigation index should be equal or greater than the pollution hazard score to deliver adequate treatment.

9.4.3 Overcoming SuDS constraints

The design of a SuDS system will be influenced by a number of physical and policy constraints. These should be taken into account and reflected upon during the conceptual, outline and detailed stages of SuDS design. Table 9-2 details some possible constraints and how they may be overcome.

Table 9-2: Example SuDS design constraints and possible solutions

Considerations	Solution
Land availability	SuDS can be designed to fit into small areas by utilising different systems. For example, features such as permeable paving and green roofs can be used in urban areas where space may be limited.
Contaminated soil or groundwater below site	SuDS can be placed and designed to overcome issues with contaminated groundwater or soil. Shallow surface SuDS can be used to minimise disturbance to the underlying soil. The use of infiltration should also be investigated as it may be possible in some locations within the site. If infiltration is not possible linings can be used with features to prevent infiltration.
High groundwater levels	Non-infiltrating features can be used. Features can be lined with an impermeable liner or clay to prevent the egress of water into the feature. Additional, shallow features can be utilised which are above the groundwater table.
Steep slopes	Check dams can be used to slow flows. Additionally, features can form a terraced system with additional SuDS components such as ponds used to slow flows.
Shallow slopes	Use of shallow surface features to allow a sufficient gradient. If the gradient is still too shallow pumped systems can be considered as a last resort.
Ground instability	Geotechnical site investigation should be done to determine the extent of unstable soil and dictate whether infiltration would be suitable or not.
Sites with deep backfill	Infiltration should be avoided unless the soil can be demonstrated to be sufficiently compacted. Some features such as swales are more adaptable to potential surface settlement.
Open space in floodplain zones	Design decisions should be done to take into consideration the likely high groundwater table and possible high flows and water levels. Features should also seek to not reduce the capacity of the floodplain and take into consideration the influence that a watercourse may have on a system. Facts such as siltation after a flood event should also be taken into account during the design phase.

Considerations	Solution
Future adoption and maintenance	Local Planning Authority should ensure development proposals, through the use of planning conditions or planning obligations, have clear arrangements for on-going maintenance over the development's lifetime.

For SuDS techniques that are designed to encourage infiltration, it is imperative that the water table is low enough. A site-specific infiltration test should be conducted early on as part of the design of the development, in order to determine the impact of permeability and groundwater levels on the effectiveness of the drainage system. Groundwater monitoring is also a requirement from the LLFA on most sites. Infiltration should be considered with caution within areas of possible subsidence or sinkholes. Where sites lie within or close to groundwater source protection zones (GSPZs) or aquifers, further restrictions may be applicable, and guidance should be sought from the LLFA and the Environment Agency.

Where frequency of flood risk, steepness of topography or permeability of geology has a significant impact on the volume or rate of surface water being discharged from a site, developers should contact the LLFA, as a review of the greenfield runoff rates to be achieved may be needed.

9.5 Sources of SuDS guidance

C753 CIRIA SuDS Manual (2015)

The C753 CIRIA SuDS Manual (2015) provides up to date guidance on planning, design, construction and maintenance of SuDS. The document is designed to help the implementation of these features into new and existing developments, whilst maximising the key benefits regarding flood risk and water quality. The manual is divided into five sections ranging from a high-level overview of SuDS, progressing to more detailed guidance with progression through the document. It is recommended that developers and the LPA utilise the information within the manual to help design SuDS which are appropriate for a development.

Non-Statutory Technical Standards for Sustainable Drainage (2015)

These have been developed by Defra to sit alongside PPG to provide non-statutory standards as to the expected design, maintenance and performance for SuDS. The LPA will make reference to these standards when determining whether proposed SuDS are considered reasonably practicable and appropriate.

In March 2015, the latest guidance was released providing amendments as to what is expected by the LPA to meet the National standards. The guidance provides a valuable resource for developers and designers outlining peak flow control, volume control, structural integrity of the SuDS, and flood considerations both within and outside the development as well as maintenance and construction considerations. It considers the following: flood risk inside and outside the development, peak flow, volume control, structural integrity, designing for maintenance considerations and construction.

The LPA will refer to these standards when determining whether proposed SuDS are considered reasonably practicable.

Further **guidance** has been provided by a Steering Group established by Defra, consisting of industry-wide stakeholders to provide an interpretation of the non-statutory technical standards.

Design and Construction Guidance for foul and surface water sewers (2019)

This guidance, which replaces the Sewers for Adoption 7th edition, is for use by developers when planning, designing and construction foul and surface water

drainage systems. The documents sets out guidance for SuDS that are intended for adoption by water companies. It provides a mechanism by which water companies can secure the adoption of a wide range of SuDS components that are complaint with the legal definition of a sewer, therefore allowing for better managed and integrated surface water systems.

Water, People, Places: A guide for master planning sustainable drainage into developments (2013)

East Sussex County Council and partner LLFAs produced a document on SuDS design and guidance, aimed at developers and planners involved in designing small and large developments in the South East of England.

Guide to Sustainable Drainage Systems in East Sussex (2015)

The East Sussex County Council document sets out the drainage design, approval and implementation process for its requirement in relation to SuDS within the East Sussex environment. This document is due to be updated as part the LLFAs wider guidance review and strategy update. Developers should therefore identify the latest guidance.

More information and guidance on SuDS is available on the **Susdrain** website.

9.6 Other surface water considerations

9.6.1 Sites of Special Scientific Interest

Natural England have designated areas as Sites of Special Scientific Interest (SSSIs) where a site has features of special interest such as its wildlife, geology and landform. There are 19 SSSIs situated either partially or entirely within Rother District. A number of these sites contain important species that are reliant on the hydrological properties of the area.

Mapping of these sites is available via **Defra's Magic Map** and should be considered when designing SuDS. Planners and developers should consult Natural England when designing sustainable drainage systems for developments within or draining to any SSSI, to learn more about any local issues that should be taken into consideration.

9.6.2 Groundwater Vulnerability Zones

The Environment Agency published new groundwater vulnerability maps in 2015. These maps provide a separate assessment of the vulnerability of groundwater in overlying superficial rocks and those that comprise the underlying bedrock. The maps show the vulnerability of groundwater at a location based on the hydrological, hydrogeological and soil properties within a one-kilometre grid square.

Two maps are available

- **Basic groundwater vulnerability map:** this shows the likelihood of a pollutant discharged at ground level (above the soil zone) reaching groundwater for superficial and bedrock aquifers and is expressed as high, medium and low vulnerability.
- **Combined groundwater vulnerability map:** this map displays both the vulnerability and aquifer designation status (principal or secondary). The aquifer designation status is an indication of the importance of the aquifer for drinking water supply.

The groundwater vulnerability classifications across Rother District are particularly complex with large areas of the District located within High and Medium – High groundwater vulnerability zones. Across areas of higher ground, the vulnerability is generally Unproductive meaning that the underlying rock layers and drift deposits have a low permeability. The groundwater vulnerability maps which can be viewed on Defra's **MAGIC map** ,should be considered when designing SuDS. Depending on

the height of the water table at the location of the proposed development site, restrictions may be placed on the types of SuDS appropriate to certain areas.

9.6.3 Groundwater Source Protection Zones (GSPZ)

The Environment Agency also defines Groundwater Source Protection Zones in the vicinity of groundwater abstraction points. These areas are defined to protect areas of groundwater that are used for potable supply, including public/private potable supply, (including mineral and bottled water) or for use in the production of commercial food and drinks. The Groundwater SPZ requires attenuated storage of runoff to prevent infiltration and contamination. The definition of each zone is shown below:

- **Zone 1 (Inner Protection Zone)** – Most sensitive zone: defined as the 50-day travel time from any point below the water table to the source. This zone has a minimum radius of 50 metres.
- **Zone 1c (Inner Protection Zone – subsurface activity only)** – Extends Zone 1 where the aquifer is confined and may be impacted by deep drilling activities.
- **Zone 2 (Outer Protection Zone)** – Also sensitive to contamination: defined by a 400-day travel time from a point below the water table. This zone has a minimum radius around the source, depending on the size of the abstraction.
- **Zone 2c (Outer Protection Zone – subsurface activity only)** – Extends Zone 2 where the aquifer is confined and may be impacted by deep drilling activities.
- **Zone 3 (Total Catchment)** - Defined as the area around a source within which all groundwater recharge is presumed to be discharged at the source. In confined aquifers, the source catchment may be displaced some distance from the source. For heavily exploited aquifers, the final Source Catchment Protection Zone can be defined as the whole aquifer recharge area where the ratio of groundwater abstraction to aquifer recharge (average recharge multiplied by outcrop area) is >0.75. Individual source protection areas will still be assigned to assist operators in catchment management.
- **Zone 4 (Zone of special** interest) – A fourth zone SPZ4 or 'Zone of Special Interest' usually represents a surface water catchment which drains into the aquifer feeding the groundwater supply (i.e. catchment draining to a disappearing stream). In the future this zone will be incorporated into one of the other zones, SPZ 1, 2 or 3, whichever is appropriate in the particular case, or become a safeguard zone.

The locations of Groundwater SPZs in the Local Plan areas are shown in Figure 9-3, covering areas around Brede, Stonegate and Ashburnham, in the south and centre of Rother District.

9.6.4 Nitrate Vulnerable Zones

Nitrate Vulnerable Zones (NVZs) are areas designated as being at risk from agricultural nitrate pollution. Nitrate levels in waterbodies are affected by surface water runoff from surrounding agricultural land entering receiving waterbodies.

The level of nitrate contamination will potentially influence the choice of SuDS and should be assessed as part of the design process. The definition of each NVZ is as follows:

- **Groundwater NVZ** – an area of land where groundwater supplies are at risk from containing nitrate concentrations exceeding the 50mg/l level dictated by the EU's Surface Water Abstraction Directive (1975) and Nitrates Directive (1991).
- **Surface Water NVZ** – an area of land where surface waters (in particular those used or intended for the abstraction of drinking water) are at risk from containing nitrate concentrations exceeding the 50 mg/l dictated by the EU's Surface Water Abstraction Directive (1975) and Nitrate Directive (1991).
- **Eutrophic NVZ** – an area of land where nitrate concentrations are such that they could/will trigger the eutrophication of freshwater bodies, estuaries, coastal waters and marine waters.

The locations of the Nitrate Vulnerable Zones in the Local Plan area are shown in Figure 9-4. There are only Surface Water NVZ's in the study area, covering most of the centre and north west of Rother District.

Figure 9-3: Groundwater Source Protection Zones in the Local Plan area

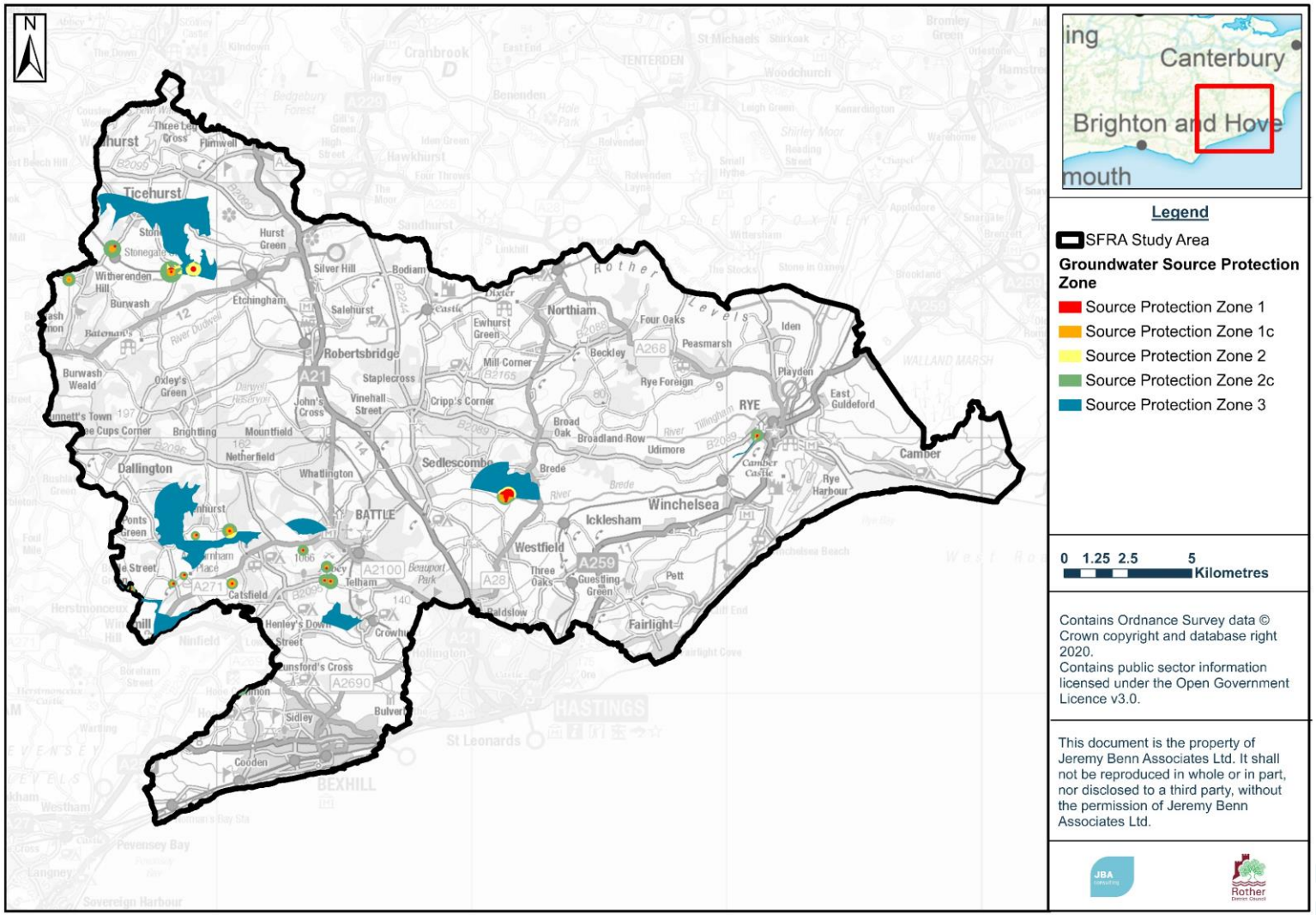
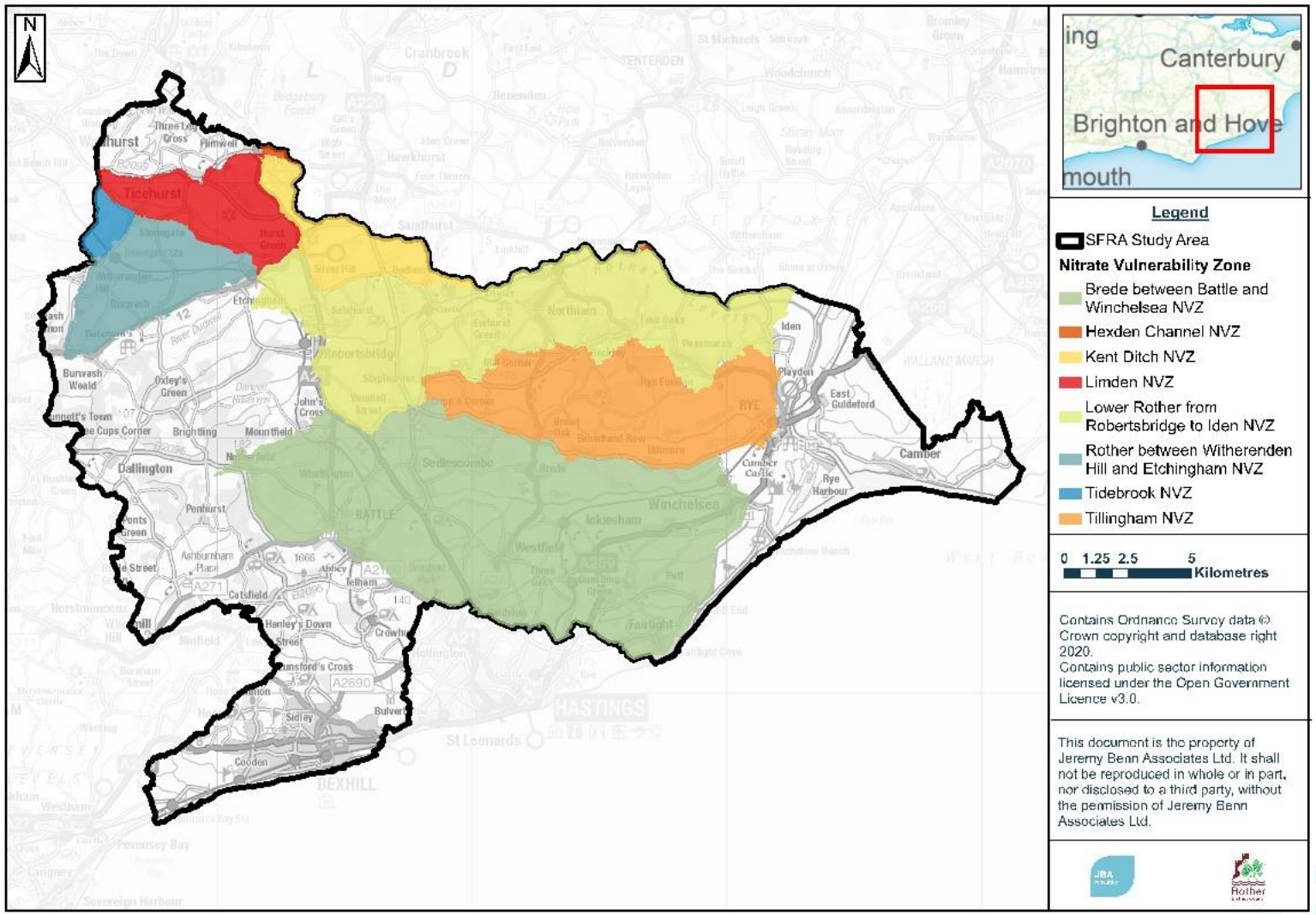


Figure 9-4: Nitrate Vulnerability Zones in the Local Plan area



10 Flood warning and emergency planning

This chapter provides guidance and advice on managing flood related incidents before, during and after flooding occurs.

10.1 Emergency planning

Emergency planning is one option to help manage flood related incidents. From a flood risk perspective, emergency planning can be broadly split into three phases: before, during and after a flood. The measures involve developing and maintaining arrangements to reduce, control or mitigate the impact and consequences of flooding and to improve the ability of people and property to absorb, respond to and recover from flooding.

In development planning, a number of emergency planning activities are already integrated in national building control and planning policies e.g. the NPPF Flood Risk Vulnerability and Flood Zone 'Compatibility' table seeks to avoid inappropriate development in areas at risk from all sources of flooding. Flood warning and emergency planning is a last resort after using this SFRA to undertake the Sequential Test appropriately first.

However, safety is a key consideration for any new development and includes residual risk of flooding, the availability of adequate flood warning systems for the development, safe access and egress routes and evacuation procedures.

The Association of Directors of Environment, Economy, Planning and Transport (ADEPT) and the Environment Agency have published a **Flood Risk Emergency Plans for New Development** document which provides guidance for Local Planning Authorities regarding their decisions over planning applications.

The **NPPF Planning Practice Guidance** outlines how developers can ensure safe access and egress to and from development in order to demonstrate that development satisfies the second part of the Exception Test. As part of an FRA, the developer should review the acceptability of the proposed access in consultation with the LPA and the Environment Agency.

There are circumstances where a flood warning and evacuation plan[12] is required and / or advised:

- It is a **requirement under the 2019 NPPF** that safe access and escape routes are included in an FRA where appropriate, as part of an agreed emergency plan.
- The **Environment Agency and Defra's standing advice** for undertaking flood risk assessments for planning applications states that details of emergency escape plans will be required for any parts of the building that are below the estimated flood level.

It is recommended that Emergency Planners at Rother District Council are consulted prior to the production of any emergency flood plan.

In addition to the **flood warning and evacuation plan considerations listed in the NPPF / PPG**, it is advisable that developers also acknowledge the following:

12 Flood warning and evacuation plans may also be referred to as an emergency flood plan or flood response plan.

- How to manage the consequences of events that are un-foreseen or for which no warnings can be provided e.g. managing the residual risk of a breach
- Proposed new development that places additional burden on the existing response capacity of the Councils will not normally be considered to be appropriate
- Developers should encourage those owning or occupying developments, where flood warnings can be provided, to sign up to receive these warnings. This applies even if the development is defended to a high standard
- The vulnerability of site occupants
- Situations may arise where occupants cannot be evacuated (e.g. prisons) or where it is safer to remain "in-situ" and / or move to a higher floor or safe refuge area (e.g. at risk of a breach). These allocations should be assessed against the outputs of the SFRA and where applicable, a site-specific Flood Risk Assessment to help develop emergency plans.

Further emergency planning information links:

- **2004 Civil Contingencies Act**
- **DEFRA (2014) National Flood Emergency Framework for England**
- **Sign up for Flood Warnings with the Environment Agency**
- **National Flood Forum**
- **GOV.UK Make a Flood Plan guidance and templates**
- **FloodRe**

10.2 Flood warning systems

Flood warnings can be derived and, along with evacuation plans, can inform emergency flood plans or flood response plans. The Environment Agency is the lead organisation for providing warnings of fluvial flooding (for watercourses classed as Main Rivers) and coastal flooding in England. Flood Warnings are supplied via the Flood Warning Service (FWS), to homes and business within Flood Zones 2 and 3. The different levels of warnings are shown in Table 10-1:Environment Agency Warnings.

Table 10-1:Environment Agency Warnings

Flood Warning Symbol	What it means	What to do
	Flood Alerts are used to warn people of the possibility of flooding and encourage them to be alert, stay vigilant and make early preparations. It is issued earlier than a flood warning, to give customers advance notice of the possibility of flooding, but before there is full confidence that flooding in Flood Warning Areas is expected.	• Be prepared to act on your flood plan • Prepare a flood kit of essential items • Monitor local water levels and the flood forecast on the Environment Agency website • Stay tuned to local radio or TV • Alert your neighbours • Check pets and livestock • Reconsider travel plans
	Flood Warnings warn people of expected flooding and encourage them to take action to protect themselves and their property.	• Move family, pets and valuables to a safe place • Turn off gas, electricity and water supplies if safe to do so • Seal up ventilation system if safe to do so • Put flood protection equipment in place • Be ready should you need to evacuate from your home • 'Go In, Stay In, Tune In'
	Severe Flood Warnings warn people of expected severe flooding where there is a significant threat to life.	• Stay in a safe place with a means of escape • Co-operate with the emergency services and local authorities • Call 999 if you are in immediate danger
Warning no longer in force	Informs people that river or sea conditions begin to return to normal and no further flooding is expected in the area. People should remain careful as flood water may still be around for several days.	• Be careful. Flood water may still be around for several days • If you've been flooded, ring your insurance company as soon as possible

It is the responsibility of individuals to sign-up to the Flood Warning Service in order to receive the flood warnings via FWS. Registration and the service is free and publicly available through **https://www.gov.uk/sign-up-for-flood-warnings** or call 0345 988 1188.

It is recommended that any household considered at risk of flooding signs-up. Developers should also encourage those owning or occupying developments, where flood warnings can be provided, to sign up to receive them. This applies even if the development is defended to a high standard.

There are currently eleven Flood Alert Areas (FAAs) and seventeen Flood Warning Areas (FWAs) located within Rother District. Some of these extend outside of the District. These are displayed in Appendix M. The FAAs in Rother District are shown in Table 10-2 and a list of FWAs are shown in Table 10-3.

Table 10-2: Flood Alert Areas within the Rother District Local Plan area

Flood Alert Code	Flood Alert Name	Waterbody	Description
065WAF453	Combe Haven	Combe Haven	Combe Haven, Powdermill and Watermill streams
064WAC305	Coast from Sandgate to Dungeness	English Channel	The coast and tidal areas from Sandgate to Lydd, including Hythe, Dymchurch, St Marys Bay, Littlestone, Greatstone, New Romney and communities on the Romney Marsh up to the Royal Military Canal
064WAC306	Coast from Fairlight to Dungeness including the Tidal Rother	English Channel, Rother	The coast and tidal areas from Fairlight to Dungeness including Dungeness, Lydd, Camber, Winchelsea Beach, Pett Level and the Tidal Rother to Rye, Rye Harbour and East Guldeford
065WAC419	Coastal areas of Bexhill seafront	English Channel	Coastal areas of Bexhill including West Parade, Egerton Park and De La Warr Parade
065WAC418	Inland areas of the Pevensey Levels	English Channel	Areas of Pevensey at risk from a high tide including the Crumbles, East Langley Levels, Mountney Bridge, Pevensey Bay, Pevensey, Manxey, Horse Eye and Hooe Levels
065WAC417	Coastal areas of Pevensey seafront	English Channel	Coastal areas of Pevensey Sea Front between Sovereign Harbour and Beach including Norman Road Pevensey, The Promenade Pevensey, The Parade Pevensey, Beachlands, Normans Bay and the Cooden Beach Hotel

Flood Alert Code	Flood Alert Name	Waterbody	Description
064WAF8UpTeise	River Teise area from Lamberhurst to Goudhurst	Teise	River Teise area from Lamberhurst to Goudhurst, including the River Bewl and tributaries of the River Teise
064WAF352	Rivers Tillingham and Brede	Tillingham, Brede	The River Tillingham, and its tributaries, from Beckley Furnace to Rye, including the Tilling Green Estate to the Railway line and the River Brede, and its tributaries, from Sedlescombe Bridge to Rye, including Winchelsea
065WAC420	Coastal areas of Bulverhythe	English Channel	Coastal areas of Bulverhythe including areas between the Railway track and Bexhill Road and West Marina Gardens
065WAF452	Langney Haven	Langney Haven	Willingdon, Eastbourne and Mountney Levels and their tributaries
064WAF351	River Rother and its tributaries from Turks Bridge to the Royal Military Canal	River Rother	River Rother and its tributaries from Turks Bridge to the Royal Military Canal, including Crowhurst Bridge, Etchingham, Robertsbridge, Salehurst and Bodiam

Table 10-3: Flood Warning Areas within the Rother District Local Plan area

Flood Warning Code	Flood Warning Name	Waterbody	Description
065FWC3502	Pevensey Levels	English Channel	Areas of Pevensey at risk from a high tide including the Crumbles, East Langley Levels, Mountney Bridge, Pevensey Bay, Pevensey, Manxey, Horse Eye and Hooe Levels
064FWF51B	River Rother at Robertsbridge	River Rother	Robertsbridge to Bodiam, including areas along the River Rother
065FWF1402	Bulverhythe	Combe Haven	Combe Haven at Bulverhythe including Bulverhythe Road and Bexhill Road at Sheepwash Bridge

Flood Warning Code	Flood Warning Name	Waterbody	Description
064FWC10A	Kings Avenue Estate and Rock Channel, Rye	River Rother	Kings Avenue Estate and Rock Channel riverside properties, Rye
065FWC3501	Pevensey seafront	English Channel	Coastal areas of Pevensey seafront between Sovereign Harbour and Beach including Norman Road Pevensey, The Promenade Pevensey, The Parade Pevensey, Beachlands, Normans Bay and the Cooden Beach Hotel
064FWF53A	Rye properties along the Tillingham	River Tillingham	Rye properties along the Tillingham, upstream of Winchelsea Road
064FWC10B	Rye, Rye Harbour and East Guldeford	River Rother	Rye Town, Rye Harbour and Harbour Road and East Guldeford
065FWC3601	Bexhill seafront	English Channel	Coastal areas of Bexhill including West Parade, Egerton Park and De La Warr Parade
064FWC9A	Winchelsea, Winchelsea Beach and Pett Level	South Coast	Winchelsea, Winchelsea Beach and Pett Level to Cliff End
064FWCDengeMarsh	East Sussex coast at Denge Marsh	English Channel, South Coast	Denge Marsh, including Coastguard Cottages and Midrips Cottages, East of Jury's Gap
064FWC9	Coast from Dungeness to Rye	English Channel, South Coast	Coastal areas from Dungeness to Rye
065FWF1401	Crowhurst	Combe Haven	Powdermill Stream at Crowhurst from the Post Office to the Recreation Ground South of Sandrock Hill Road
064FWF51A	River Rother at Etchingham	River Rother	Etchingham, including areas along the railway east and south of the village

Flood Warning Code	Flood Warning Name	Waterbody	Description
064FWC8B	Coast from Littlestone Golf Course to Dungeness	English Channel	Coastal areas from Littlestone Golf Course to Dungeness
064FWF52A	Winchelsea properties adjacent to the Brede	River Brede	Winchelsea properties adjacent to the Brede, including parts of the Royal Military Road, Station Road and Winchelsea Lane
065FWC3701	Bulverhythe Seafront	English Channel	Coastal areas of Bulverhythe including areas between the Railway track and Bexhill Road and West Marina Gardens
064FWF52B	New Winchelsea Road, Rye	River Brede	New Winchelsea Road, upstream of Harbour Road Rye

10.2.1 Local arrangements for managing flood risk

The Sussex Resilience Forum have a Part 1 Multi-Agency Flood Plan (MAFP) that is prepared and maintained with assistance from East Sussex County Council and Local Authorities across Sussex, setting out the framework for the response of different responder's to a flood event. A number of high-risk areas across East Sussex have additional, specific multi-agency plans in place (Part 2 MAFP's). Within Rother District, Rye Bay has a Part 2 MAFP that is tailored to the individual area.

The **Sussex Resilience Forum website** contains information on how to prepare for and respond to emergencies in the local area.

10.2.2 Managing Flood Emergencies in Rother

The **ESCC Emergency Response Plan** sets out the arrangements that will be made in an emergency. It identifies the roles and responsibilities of those involved in the response and how major incidents such as flooding are managed.

The Emergency Planning Team at ESCC will notify Rother District Council when there is the need to activate a specific flood plan to respond to a risk of coastal or fluvial flooding, or when there is a need for an emergency response to surface water flooding. Rother District Council will liaise closely with ESCC, the Environment Agency, East Sussex Highways and other partners to coordinate a response.

10.3 Emergency planning and development

10.3.1 NPPF

The **PPG Flood Risk Vulnerability and Flood Zone 'incompatibility' table** seeks to avoid inappropriate development in areas at risk from all sources of flooding. It is essential that any development which will be required to remain operational during a flood event is located in the lowest flood risk zones to ensure that, in an emergency, operations are not impacted on by flood water or that such infrastructure is resistant to the effects of flooding such that it remains serviceable/operational during 'upper

end' events, as defined in the Environment Agency's Climate Change allowances (May 2022). For example, the PPG classifies police, ambulance and fire stations and command centres that are required to be operational during flooding as Highly Vulnerable development, which is not permitted in Flood Zones 3a and 3b and only permitted in Flood Zone 2 providing the Exception Test is passed. Essential infrastructure located in Flood Zone 3a or 3b must be operational during a flood event to assist in the emergency evacuation process. All flood sources such as fluvial, surface, groundwater, sewers and artificial sources (such as canals and reservoirs) should be considered. In particular sites should be considered in relation to the areas of drainage critical problems highlighted in the relevant SWMPs.

The outputs of this SFRA should be compared and reviewed against any emergency plans and continuity arrangements. This includes the nominated rest and reception centres (and prospective ones), so that evacuees are outside of the high-risk Flood Zones and will be safe during a flood event.

10.3.2 Safe access and egress

The NPPF Planning Practice Guidance outlines how developers can secure safe access and egress to and from development in order to demonstrate that development satisfies the second part of the Exception Test[13]. Access considerations should include the voluntary and free movement of people during a '**design flood**' as well as for the potential of evacuation before a more extreme flood. The access and egress must be functional for changing circumstances over the lifetime of the development. The Planning Practice Guidance sets out that:

- Access routes should allow occupants to safely access and exit their dwellings in design flood conditions. In addition, vehicular access (no more than 300mm depth or 1.5m/s velocity) for emergency services to safely reach development in design flood conditions is normally required; and
- Where possible, safe access routes should be located above design flood levels and avoid flow paths including those caused by exceedance and blockage. Where this is unavoidable, limited depths of flooding may be acceptable providing the proposed access is designed with appropriate signage etc. to make it safe. The acceptable flood depth for safe access will vary as this will be dependent on flood velocities and risk of debris in the flood water. Even low levels of flooding can pose a risk to people in-situ (because of, for example, the presence of unseen hazards and contaminants in floodwater, or the risk that people remaining may require medical attention).
- Where a failure of flood risk management infrastructure would result in flooding with a speed-of-onset that would not allow sufficient time for safe access and escape, an internally accessible place of safety, capable of accommodating the likely number of occupants or users of the proposed development should also be provided. Local planning authorities should consider whether the development can be considered safe given the predicted duration of flooding and the vulnerability of occupants/users. In doing so, local planning authorities should account for the likely impacts of flooding on essential services such as electricity, gas, telecommunications, water supply and sewerage. Any place of safety needs to be designed to facilitate rescue in case emergency care is needed or if it is unlikely to be safe for occupants/users to wait until flood waters have receded sufficiently for safe access/escape to be possible.

13 NPPF Planning Practice Guidance: Flood Risk and Coastal Change (paragraph 039, Reference ID: 7-056-20140306) March 2014

The depth, velocity and hazard mapping from hydraulic modelling, which will form part of the Flood Risk Assessment, should help inform the provision of safe access and egress routes.

As part of a Flood Risk Assessment , the developer should review the acceptability of the proposed access in consultation with Rother District Council and the Environment Agency. Site and plot specific velocity and depth of flows should be assessed against standard hazard criteria to ensure safe access and egress can be achieved.

10.3.3 Potential evacuations

During flood incidents, evacuation may be considered necessary. The Planning Practice Guidance states practicality of safe evacuation from an area will depend on[14]:

1. the type of flood risk present, and the extent to which advance warning can be given in a flood event;
2. the number of people that would require evacuation from the area potentially at risk;
3. the adequacy of both evacuation routes and identified places that people could be evacuated to (and taking into account the length of time that the evacuation may need to last); and
4. sufficiently detailed and up to date evacuation plans being in place for the locality that address these and related issues.

The vulnerability of the occupants is also a key consideration. The NPPF and application of the Sequential Test aims to avoid inappropriate development in flood risk areas. However, developments may contain proposals for mixed use on the same site. In this instance, the Planning Practice Guidance states that layouts should be designed so that the most vulnerable uses are restricted to higher ground at lower risk of flooding, with development which has a lower vulnerability (parking, open space etc.) in the highest risk areas, unless there are overriding reasons to prefer a different location[15]. Where the overriding reasons cannot be avoided, safe and practical evacuation routes must be identified.

The Environment Agency and Defra provide standing advice for undertaking flood risk assessments for planning applications. Please refer to **the government website** for the criteria on when to follow the standing advice. Under these criteria, you will need to provide details of emergency escape plans for any parts of the building that are below the estimated flood level. The plans should show;

- single storey buildings or ground floors that do not have access to higher floors can access a space above the estimated flood level, e.g. higher ground nearby;
- basement rooms have clear internal access to an upper level, e.g. a staircase; and
- occupants can leave the building if there is a flood and there is enough time for them to leave after flood warnings[16].

Situations may arise where occupants cannot be evacuated (e.g. prisons) or where it is safer to remain "in-situ" and / or move to a higher floor or safe refuge area (e.g. developments located immediately behind a defence and at risk of a breach). These

14 NPPF Planning Practice Guidance: Flood Risk and Coastal Change (paragraph 057, Reference ID: 7-057-20140306) March 2014

15 NPPF Planning Practice Guidance, Reducing the causes and impacts of flooding Paragraph: 053 Reference ID: 7-053-20140306

16 Environment Agency and DEFRA (2012) Flood Risk Assessment: Standing Advice: https://www.gov.uk/flood-risk-assessment-standing-advice

allocations should be assessed against the outputs of the SFRA and where applicable, a site-specific Flood Risk Assessment to help develop appropriate emergency plans.

10.3.4 Flood warning and evacuation plans

Flood warning and evacuation plans should outline potential mitigation measures to manage the residual risk, as stated in the Planning Practice Guidance. It is a requirement under the NPPF that a flood warning and evacuation plan is prepared for sites at risk of flooding used for holiday or short-let caravans and camping and are important at any site that has transient occupants (e.g. hostels and hotels).

A flood warning and evacuation plan should detail arrangements for site occupants on what to do before, during and after a flood as this will help to lessen its impact, improve flood response and speed up the recovery process. The Environment Agency provides practical advice and templates on how to prepare flood plans for individuals, communities and businesses (see text box below for useful links).

It is recommended that emergency planners at East Sussex County Council are consulted prior to the production of any emergency flood plan. The council will provide guidance to help local communities to protect their home and valuables and understand what to do before, during and after a flood.

Once the emergency flood plan is prepared, it is recommended that it is distributed to emergency planners at East Sussex County Council and the emergency services. When developing a flood warning and evacuation plan, it is recommended that it links in with any existing parish / community level plan. Local Parish Council's should be contacted to establish if a community level plan exists for an area.

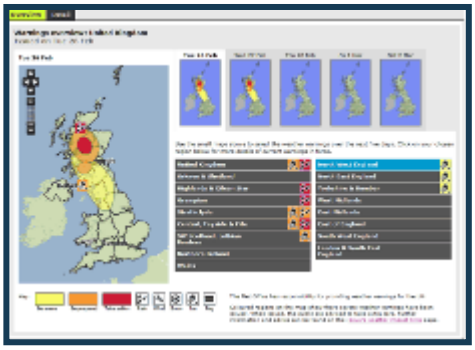
Guidance documents for preparation of flood response plans

- **Environment Agency (2012) Flooding – minimising the risk, flood plan guidance for communities and groups**
- **Environment Agency (2014) Community Flood Plan template**
- **Environment Agency Personal flood plans**
- **ADEPT and the Environment Agency (2019) - Flood Risk Emergency Plans for New Development**

10.3.5 Other sources of information

The joint guidance on **flood risk emergency plans for new development** which has been produced between the Environment Agency and the Association of Directors of Environment, Economy, Planning and Transport (ADEPT) aims to support robust consideration of whether proposed development will be safe. The guidance will help developers and their consultants produce suitable emergency plans.

As well as being a statutory consultee for new development at risk of flooding, the Environment Agency can offer independent technical advice. The Environment Agency website contains a breadth of information on flood risk and there are numerous publications and guidance available. For example, the **"flooding from groundwater"** guide has been produced by the Environment Agency and Local Government Association to offer practical advice to reduce the impact of flooding from groundwater.



The Met Office provides a National Severe Weather Warning Service about rain, snow, wind, fog and ice. The severity of warning is dependent upon the combination of the likelihood of the event happening and the impact the conditions may have. In simplistic terms, the warnings mean: Yellow: Be Aware, Amber: Be Prepared, Red: Take Action. This service does not provide flood warnings. The Met Office provide many other services and products. For further information, please visit their **website**.

The **National Flood Forum** (NFF) is a national charity, set up in 2002 to support those at risk and affected by flooding. The NFF helps people to prepare and recover from flooding as well as campaigning on behalf of flood risk communities, including providing advice on matters such as insurance.

Individual property flood resilience protection (PFR) measures are design to help protect homes and businesses from flooding. These include a combination of flood resistance measures - trying to prevent water ingress – and flood resilience measures - trying to limit the damage and reduce the impact of flooding, should water enter the building. It is important that any measures have the BSI Kitemark. This shows that the measure has been tested and ensures that it meets industry standards. Please visit the **Government website: "Prepare for flooding"** for more information.

11 Strategic flood risk solutions

This chapter provides information on strategic flood risk solutions (for example flood storage schemes and natural flood management) and how these could be implemented.

11.1 Introduction

Strategic flood risk solutions may offer a potential opportunity to reduce flood risk in the study area. The following sections outline different options which could be considered for strategic flood risk solutions. Any strategic solutions should ensure they are consistent with wider catchment policy and the local policies. It is important that the ability to deliver strategic solutions in the future is not compromised by the location of proposed development. When assessing the extent and location of proposed development consideration should be given to the requirement to secure land for flood risk management measures that provide wider benefits.

Not all measures will be appropriate for all development sites, however this is intended as a guide to identify some of the more common solutions. Discussions should be held with East Sussex County Council as the LLFA and the Environment Agency where strategic solutions are being considered to confirm their appropriateness. Design guides for many of these solutions are published by **CIRIA**.

11.2 Flood storage schemes

Flood storage schemes aim to reduce the flows passed downriver to mitigate downstream flooding. Development increases the impermeable area within a catchment, creating additional and faster runoff into watercourses. Flood storage schemes aim to detain this additional runoff, releasing it downstream at a slower rate, to avoid any increase in flood depths and/or frequency downstream. Methods to provide these schemes include[17]

- enlarging the river channel;
- raising the riverbanks; and/or
- constructing flood banks set back from the river.

Flood storage schemes have the advantage that they generally benefit areas downstream, not just the local area.

No flood storage schemes are currently in place within Rother District. However, under the Rother Area Drainage Improvements Scheme (RADIS) completed in the 1960s, the Rother Wet Levels, upstream of Blackwell Bridge, were designed to provide floodplain storage during periods of high flow when the river is tide locked.

11.2.1 Promotion of SuDS

By considering SuDS at an early stage in the development of a site, the risk from surface water can be mitigated to a certain extent within the site as well as reduce the risk that the site poses to third party land. Regionally SuDS should be promoted on all new developments to ensure the quantity and quality of surface water is dealt with sustainably to reduce flood risk. The policies and guidance produced by ESCC as the LLFA (summarised in Section 9) should be used by developers to produce

17 Environment Agency: Fluvial Design Guide – Chapter 10 (2010)

technically proficient and sustainable drainage solutions that conform with the non-statutory standards for SuDS (2015).

11.3 Natural Flood Management

Developments provide opportunities to work with natural processes of catchments, floodplains, rivers and the coast to reduce flood and erosion risk, benefit the natural environment and reduce costs of schemes. Natural flood management requires integrated catchment management and involves those who use and shape the land. It also requires partnership working with neighbouring authorities, organisations and water management bodies. The Environment Agency has developed **Natural Flood Management (NFM) mapping** which displays opportunities for NFM.

The **Spatial prioritisation of catchments suitable for using Natural Flood Management** dataset can be used to identify Water Framework Directive (WFD) catchments within the region which have the greatest NFM potential.

Conventional flood prevention schemes may be preferred, but consideration of 're-wilding' rivers upstream could provide cost efficiencies as well as considering multiple sources of flood risk; for example, reducing peak flows upstream such as through felling trees into streams or building earth banks to capture runoff, could be cheaper and smaller-scale measures than implementing flood walls for example. With flood prevention schemes, consideration needs to be given to the impact that flood prevention has on the WFD status of watercourses. It is important that any potential schemes do not have a negative impact on the ecological and chemical status of waterbodies.

The **Sussex Flow Initiative** is a partnership formed between Sussex Wildlife Trust and the Environment Agency focused on providing natural flood risk management solutions for the Powdermill catchment within Rother District. NFM techniques currently being considered for the catchment include pond and washland creation and hedge and tree planting. The initiative aims to work with communities, landowners and local parishes in the area to help make the Powdermill Stream sub-catchment more water and flood resilient, as well as improving habitats for wildlife.

A number of the different NFM approaches and techniques are summarised in the following sections.

11.3.1 Catchment and Floodplain restoration

Compared to flood defences and flood storage, floodplain restoration represents the most sustainable form of strategic flood risk solution, by allowing watercourses to return to a more naturalised state, and by creating space for naturally functioning floodplains working with natural processes.

Although the restoration of floodplain is difficult in previously developed areas where development cannot be rolled back, the following measures should be adopted:

- Promoting existing and future brownfield sites that are adjacent to watercourses to naturalise banks as much as possible. Buffer areas around watercourses provide an opportunity to restore parts of the floodplain (see Section 8.5)
- Removal of redundant structures to reconnect the river and the floodplain
- Apply the Sequential Approach to avoid new development within the floodplain.

For those sites considered within the Local Plan Review and/or put forward by developers, that also have watercourses flowing through or past them, the sequential approach should be used to locate development away from these watercourses. This

will ensure the watercourses retain their connectivity to the floodplain. Loss of floodplain connectivity could potentially increase flooding.

11.3.2 Re-naturalisation

There is potential to re-naturalise a watercourse by re-profiling the channel, removing hard defences, re-connecting the channel with its floodplain and introducing a more natural morphology (particularly in instances where a watercourse has historically been modified through hard bed modification). Detailed assessments and planning would need to be undertaken to gain a greater understanding of the response to any proposed channel modification.

11.4 Structure removal and/or modification (e.g. Weirs)

Structures, both within watercourses and adjacent to them can have significant impacts upon rivers including alterations to the geomorphology and hydraulics of the channel through water impoundment and altering sediment transfer regime, which over time can significantly impact the channel profile including bed and bank levels, alterations to flow regime and interruption of biological connectivity, including the passage of fish and invertebrates.

Many artificial in-channel structures (examples include weirs and culverts) are often redundant and/or serve little purpose and opportunities exist to remove them where feasible. The need to do this is heightened by climate change, for which restoring natural river processes, habitats and connectivity are vital adaptation measures. However, it also must be recognised that some artificial structures may have important functions or historical/cultural associations, which need to be considered carefully when planning and designing restoration work.

In the case of weirs, whilst removal should be investigated in the first instance, in some cases it may be necessary to modify a weir rather than remove it. For example, by lowering the weir crest level or adding a fish pass. This will allow more natural water level variations upstream of the weir and remove a barrier to fish migration.

11.5 Bank Stabilisation

Bank erosion should be avoided, and landowners encouraged to avoid using machinery and vehicles close to or within the watercourse except where required for maintenance.

There are several techniques that can be employed to restrict the erosion of the banks of a watercourse. In an area where bankside erosion is particularly bad and/or vegetation is unable to properly establish, ecologically sensitive bank stabilisation techniques, such as willow spiling, can be particularly effective. Live willow stakes thrive in the moist environment and protect the soils from further erosion allowing other vegetation to establish and protect the soils.

11.6 Flood defences

There are a number of formal flood defences present within the Local Plan area (see Section 7 for further information). The flood risk at several potential sites identified within the Rother District could be influenced by the presence of these defences. At these locations it will be important to understand the benefit that defences can have on reducing flooding, and consequences if their design standard is exceeded or they fail. Residual risk of these defences should be understood and managed. Maintenance arrangements, including funding mechanisms, for the defences will need to be evidenced for the lifetime of development.

The Folkestone to Cliff End Flood Risk Management Strategy sets out strategic plans to improve the standard of protection of coastal defences within the District over the

next 100 years and thus reduce residual risk. This ongoing capital programme of work is reliant on funding from the central government and other sources. These may include developer contributions from local commercial interests that may benefit directly from a reduction in flood risk.

If defences are constructed to protect a development site, it will need be demonstrated that the defences will not have a resulting negative impact on flood risk elsewhere, and that there is no net loss in floodplain storage.

Areas that do not benefit from flood or coastal protection should be safeguarded against future development. In the case of coastal protection, the **South Foreland to Beachy Head Shoreline Management Plan** (SMP) identifies a 'no active intervention' approach is taken between Cliff End and Fairlight Cove and at Fairlight Cove West within the Local Plan area (Appendix E). Therefore, it is recommended that, these areas are safeguarded against future development where land in the SMP has been identified as at risk of coastal erosion. In the case of flood protection, anywhere within Flood Zone 3b (Appendix C) should be safeguarded as a minimum.

11.7 Green Infrastructure

Green infrastructure (GI) is a planned and managed network of natural environmental components and green spaces that intersperse and connect the urban centres, suburbs and rural fringe and consist of:

- Open spaces – parks, woodland, nature reserves, lakes
- Linkages – River corridors and canals, and pathways, cycle routes and greenways
- Networks of "urban green" – private gardens, street trees, verges and green roofs.

The identification and planning of Green Infrastructure is critical to sustainable growth. It merits forward planning and investment as much as other socio-economic priorities such as health, transport, education and economic development. GI is also central to climate change action and is a recurring theme in planning policy. With regards to flood risk, green spaces can be used to manage storm flows and free up water storage capacity in existing infrastructure to reduce risk of damage to urban property, particularly in city centres and vulnerable urban regeneration areas. Green infrastructure can also improve accessibility to waterways and improve water quality, supporting regeneration and improving opportunity for leisure, economic activity and biodiversity.

Rother District Council's Core Strategy contains a number of policies that encourage the creation of a Green Infrastructure network within the region (SRM1, EN5 and RY1). A **Green Infrastructure Study** was originally produced by Rother District Council in 2011, followed by an addendum in 2016, as background evidence to support the adopted Local Plan. The study identified spaces that contribute to green infrastructure in the district and potential opportunities for future green infrastructure provision.

11.8 Engaging with key stakeholders

Flood risk to an area or development can often be attributed to a number of sources such as fluvial, surface water and/or groundwater. In rural areas the definition between each type of flood risk is more distinguished. However, within urban areas flooding from multiple sources can become intertwined. Where complex flood risk issues are highlighted it is important that all stakeholders are actively encouraged to work together to identify issues and provide suitable solutions.

Engagement with riparian owners is also important to ensure they understand their rights and responsibilities including:

- maintaining river bed and banks;
- allowing the flow of water to pass without obstruction; and
- controlling invasive alien species e.g. Japanese knotweed.

More information about riparian owner responsibilities can be found in the Environment Agency's guidance on **Owning a Watercourse** (2018).

11.9 Potential future strategic flood risk schemes

At this stage, no significant potential future schemes have been identified within Rother District and as a result, no land has been identified as needing to be safeguarded for future schemes. However, it is possible that this will change once sites have been identified and consequently this may be updated through an addendum.

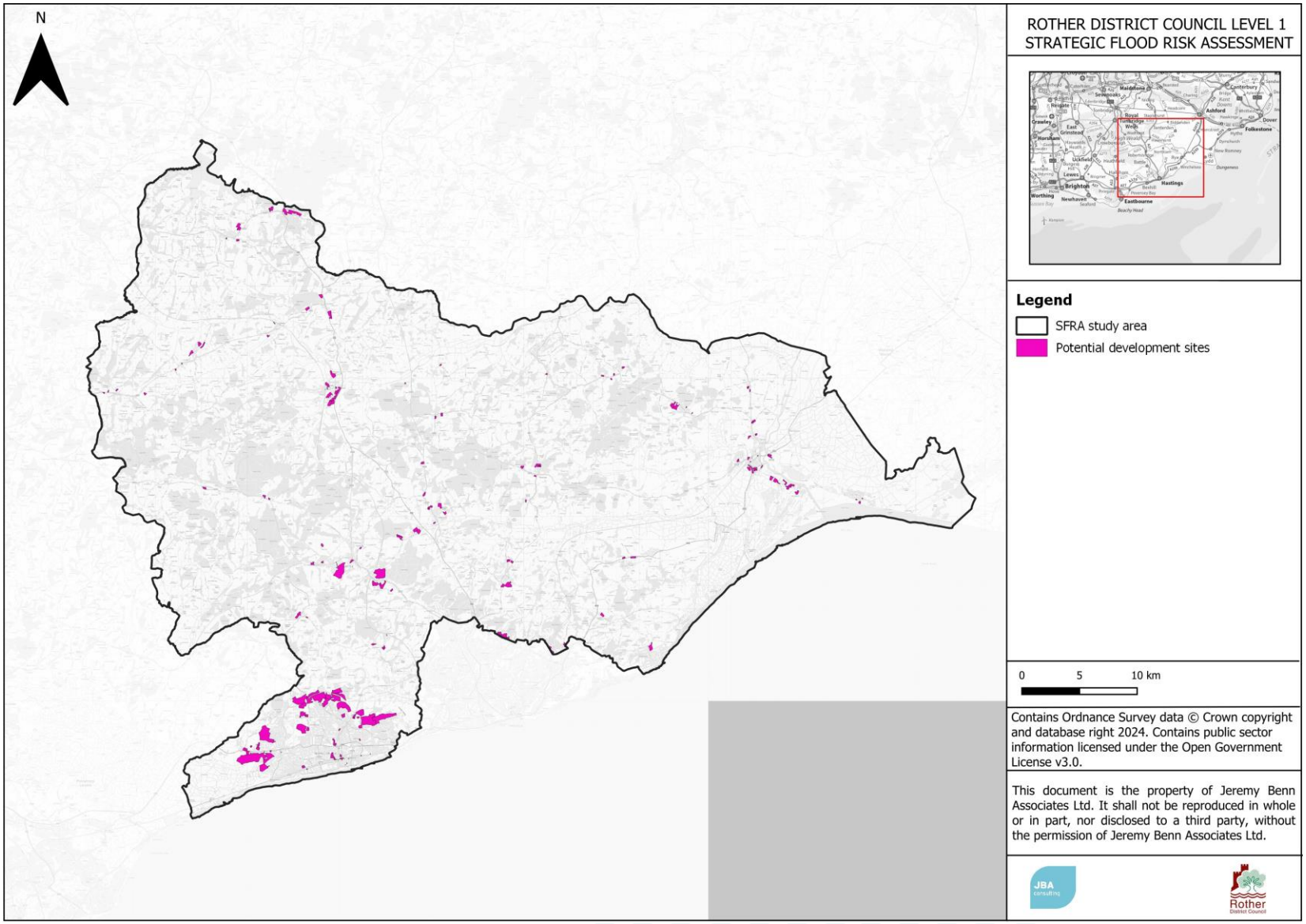
12 Level 1 summary assessment of potential development locations

12.1 Introduction

This section details the site screening of potential development sites that was carried out as part of the Level 1 SFRA. Please refer to Appendix N which displays the site screening for Rother District Council.

A total of 181 sites were provided by Rother District Council as displayed in Figure 12-1. They have been screened against a suite of available flood risk information and spatial data to provide a summary of flood risk to each site.

Figure 12-1: The 181 sites within Rother District Council screened as part of this Level 1 SFRA



The information considered includes the flood risk datasets listed below:

- Flood Map for Planning
- SFRA Flood Zones 2, 3a and 3b
- Fluvial climate change allowances
- Tidal climate change allowances
- Environment Agency Risk of Flooding from Surface Water
- Environment Agency Risk of Flooding from Surface Water with allowances for climate change
- Environment Agency Reservoir Flood Extent (dry and wet day scenarios)
- Environment Agency Historic Flood Map
- East Sussex County Council's recorded flood incidents
- JBA Groundwater Emergence Map

A site screening spreadsheet has been prepared which identifies the proportion of each site that is affected by sources of flooding. The information provided is intended to enable a more informed consideration of sites when applying the Sequential Test. The site screening spreadsheet has been used to determine whether more detailed assessment of sites is needed to further identify those that should be taken forwards as potential development allocations for a Level 2 assessment.

12.2 Overview of identified sites

A summary of flood risk at each of the sites in light of the screening is provided below:

- Approximately two thirds of all screened sites have Flood Zone 1 comprising the largest proportion of their area, with 140 sites completely located within Flood Zone 1.
- 31 sites are partially located in Flood Zone 2.
- 37 sites are wholly or partially located in Flood Zone 3a.
- 18 sites are partially located in SFRA Flood Zone 3b.
- 11 sites intersect with the Environment Agency's Recorded Flood Outlines.
- Six sites are classed as being partially located within a 'high risk' groundwater emergence flood risk zone (groundwater within 0 – 0.025m of the ground surface).
- 11 sites are classed as being within a 'moderate risk' groundwater emergence flood risk zone (groundwater within 0.025 – 0.5m of the ground surface).
- 79 sites are predicted to be at risk during a present day 1% AEP surface water flood event.
- 127 sites are predicted to be at risk during a 1% AEP surface water flood event with an allowance for climate change.

12.3 Sequential Testing

This SFRA does not include the application Sequential Test of the development sites that were screened. However, Appendix N summarises the flood risk to the potential and confirmed development sites and provides evidence for use in completion of the Sequential Test. Guidance on how this information should be used to inform the Sequential and Exception Tests can be found in Appendix O.

The assessments undertaken for this SFRA will assist Rother District Council in the preparation of the Sequential Test as outlined in Appendix 149.

12.4 Cumulative impacts of development on flood risk

Cumulative impacts are defined as the effects of past, current and future activities on the environment. Under the NPPF, strategic policies and their supporting SFRAs, are required to 'consider cumulative impacts in, or affecting, local areas susceptible to flooding' (**para 166**).

When allocating land for development, consideration should be given to the potential cumulative impact on flood risk within a catchment. Development increases the impermeable area within a catchment, which if not properly managed, can cause loss of floodplain storage, increased volumes and velocities of surface water runoff, and result in heightened downstream flood risk. Whilst individual development with appropriate site mitigation measures should not result in measurable local effects with respect to hydrology and flood risk, the cumulative effect of multiple development may be more severe at sensitive downstream locations in the catchment. Locations where there are existing flood risk issues with people, property or infrastructure will be particularly sensitive to cumulative effects.

The cumulative impact should be considered throughout the planning process, from the allocation of sites within the Local Plan, to the planning application and development design stages.

Site-specific FRAs must consider the cumulative impact of the proposed development on flood risk within the wider catchment area if there are potentially material effects.

As part of the Level 1 SFRA, an assessment of the cumulative effects within catchments in Rother District Council's boundary has been undertaken.

12.4.1 Approach and methodology

The approach is based on providing an assessment of catchments where the allocation of more than one site could result in effects that increase the flood risk to third parties. At a strategic level this involves comparison of catchments, to assess the quantum of proposed development and the sensitivity of the catchment to changes in flood risk. Historic flooding incidents are also included in the assessment, as these are an indicator of the actual sensitivity of locations within a catchment to flood events.

The methodology deploys a range of metrics to assess the potential cumulative impacts, which provide a balance between predicted and observed flooding data recorded by Rother District Council and the Environment Agency. In addition, it was considered important to identify those catchments where an increase in flows (as a result of development) would potentially have the greatest impact upon downstream flood risk.

12.4.2 Datasets

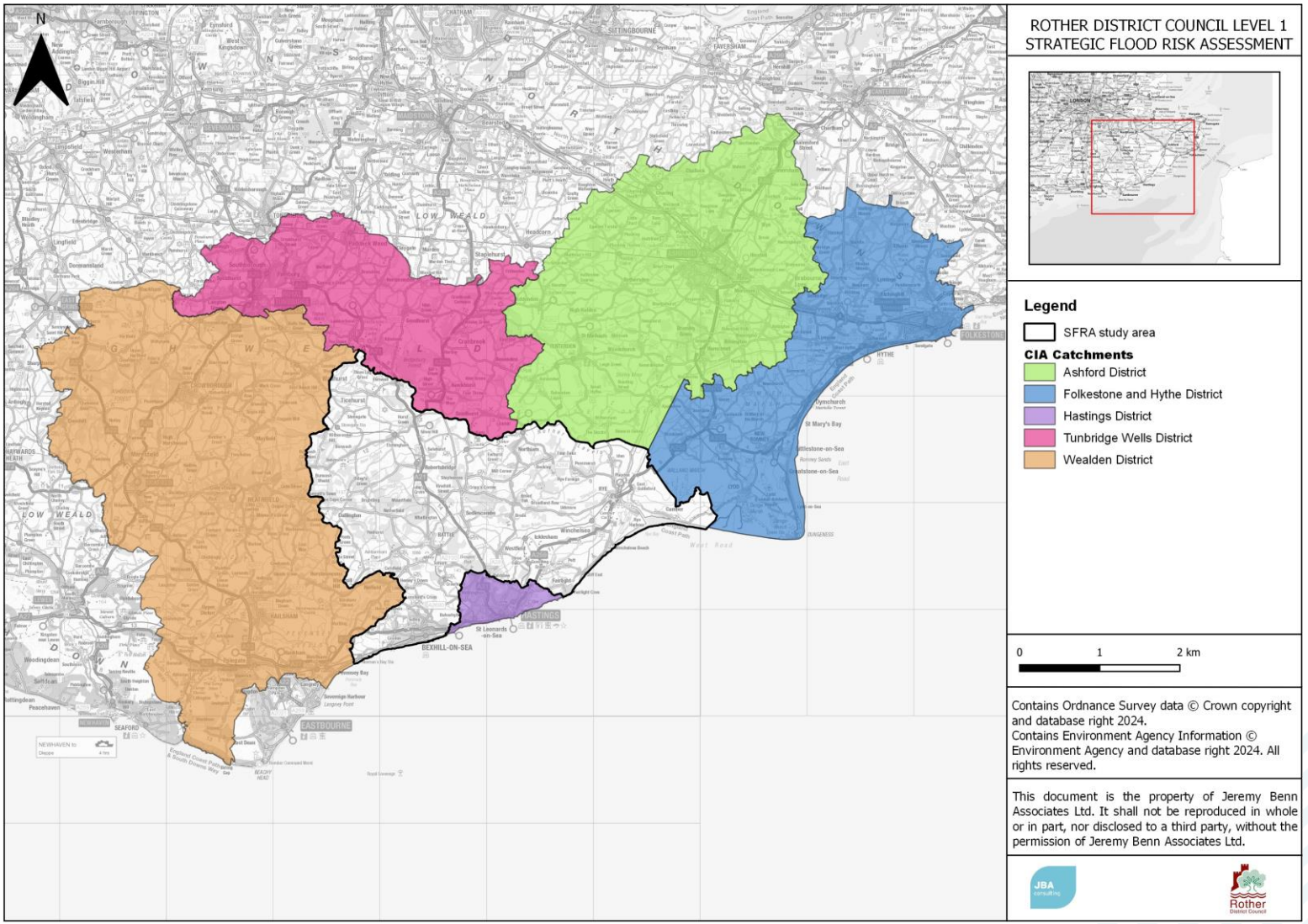
Catchments

The WFD river catchments defined in the River Basin Management Plans were used to divide Rother District and surrounding local authorities into manageable areas on which to be base a cumulative impact assessment. The surrounding authorities included in the CIA are:

- Ashford District
- Wealden District
- Tunbridge Wells District

The catchments used in this CIA are displayed in Figure 12-2: Catchments assessed within the Cumulative Impact Assessment for this Level 1 SFRA . Site allocation data provided by Ashford, Wealden and Tunbridge Wells Districts were included in the CIA.

Figure 12-2: Catchments assessed within the Cumulative Impact Assessment for this Level 1 SFRA



Current developed area

OS Open Zoomstack data buildings layer was used to assess the current developed area in each catchment.

Proposed level of growth

To understand areas of Rother District Councils boundary that are likely to experience the greatest pressure for future growth, all potential future development sites received have been analysed. The sites allocated through the Local Plans of neighbouring authorities have also been taken into account within the proposed level of growth for each catchment.

This allowed the calculation of the overall increase in development from the existing scenario to identify catchments likely to be under the greatest pressure from development. The context for this being that in circumstances where the proportion of proposed new development is greater, then it is more likely to give rise to cumulative effects.

It should be noted that it was assumed that all sites will be developed, and that the entire site footprint would be developed.

Historic Flood Risk

A historic flood risk score was derived for each catchment within the study area using the total area of 'buildings' from the OS Open Zoomstack data within the Environment Agency's historic flood map extent for each catchment.

Properties sensitive to increased flood risk

It is important to understand which catchments are most sensitive to increases in flood flows which may theoretically be caused by new development. Predicted flood risk was assessed using the following datasets:

- Total number properties within the merged 1% AEP surface water flooding extent and Flood Zone 3a for each catchment.
- Total number properties within the merged 0.1% AEP surface water flooding extent and Flood Zone 2.

The difference in the number properties at risk in these two datasets has then been used as an indicator to identify which catchments are more sensitive to increases in flood flows.

12.4.3 Ranking of catchments

To identify which catchments are more sensitive to cumulative impacts, each catchment was given a ranking for each of the three metrics (proposed level of growth, historic flood risk and properties sensitive to growth). These rankings were then combined to give an overall ranking which was divided into three categories - high, medium, and low according to how sensitive each catchment is to cumulative impacts relative to one another.

12.4.4 Conclusions from the Cumulative Impact Assessment

A summary of the Cumulative Impacts Assessment results is shown in Figure 12-3. The Cumulative Impact Assessment highlights areas where there is a high chance of encountering cumulative effects from planned development. In these catchments this should be considered by developers and specifically addressed within FRAs for proposed development.

Including consideration of cumulative effects requires that FRAs should assess:

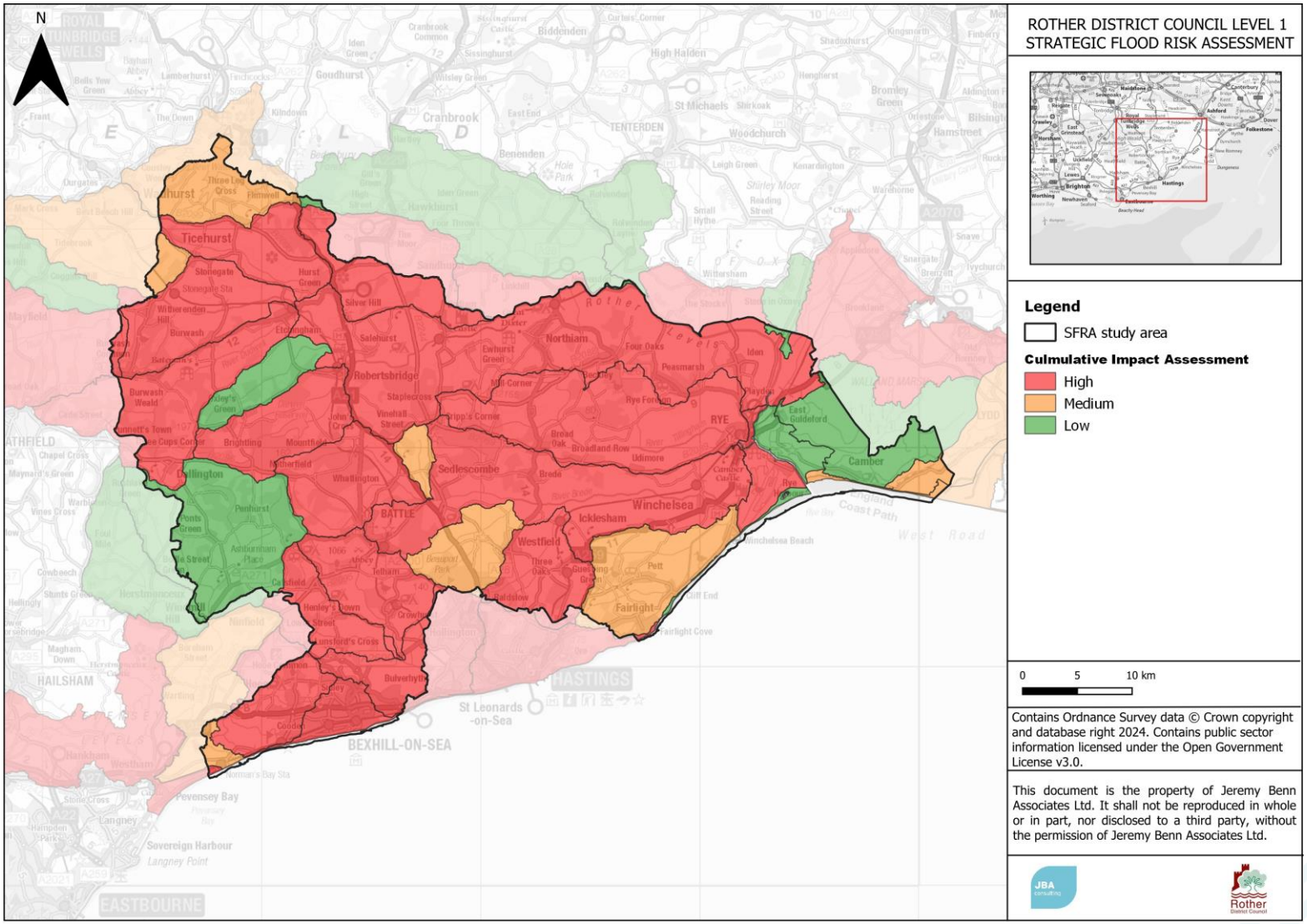
- The location and sensitivity of receptors to cumulative effects and the mechanisms that potentially result in flooding (e.g., locations that are reliant on the performance of pumped drainage systems to manage flood risk, locations where existing flooding is experienced and can be exacerbated by relatively small changes in flood flow magnitude, volume, or flood duration, etc).
- The potential quantum of proposed cumulative development within a River Basin and assessment of the effect on sensitive receptors of the cumulative benefit afforded by piecemeal mitigation at the respective allocation sites.
- The requirement for measures to address potential cumulative effects (these can be both 'on-site' measures and contributions to strategic 'off-site' measures).
- The opportunity to integrate site mitigation measures with strategic flood risk management measures planned in the River Basin.
- The long-term commitments to management and maintenance.

12.4.5 Next steps

The Cumulative Impact Assessment is used in the following ways:

- The assessment highlights the catchments in Rother District where the cumulative impacts of development on flood risk could potentially be greatest. Developers and Rother District Council should take the assessment into consideration when identifying appropriate sites for development.
- For sites in catchments identifies as being high or medium risk of cumulative impacts FRAs should contain an assessment of the potential cumulative impacts of development further.

Figure 12-3: Cumulative Impact Assessment of WFD Catchments within Rother District



13 Summary

13.1 Overview

This Level 1 SFRA delivers a strategic assessment of all sources of flooding in the Local Plan area. It also provides an overview of policy and provides guidance for planners and developers.

The study area comprises the administration area of Rother District Council.

13.2 Sources of flood risk

The sources of flood risk in the study area have been assessed, further information on the data sources used can be found in Section 5 and the findings can be found in Section 6. A summary is outlined below.

13.2.1 Historic flood risk

There have been several recorded flood incidents across the area of Rother District, with the most frequent sources of flooding being fluvial in the upper catchment, tidal flooding along the coastline, and a combination of both fluvial and tidal in the lower catchment. The most significant food incidents occurred in 2000, when three successive fluvial events resulted in widespread flooding of 152 properties in Robertsbridge and 16 in Etchingham, and in 2013/14, when fluvial and tidal flooding caused a breach of the Rye Harbour tidal wall.

13.2.2 Fluvial flood risk

The River Rother, River Brede and River Tillingham are the main watercourses within the Local Plan area identified to be contributing to fluvial flood risk. Flooding on their lower reaches, and similarly with Combe Haven, East Stream and Picknell Green Stream, can be influenced by tidal levels with the potential for tidal locking to occur where incoming high tides prevent fluvial flows from discharging into the sea.

Flood Zone mapping and climate change mapping of the fluvial flood risk in the Local Plan area has been prepared as part of the Level 1 SFRA and can be found in Appendix C and D. The key settlements identified to be at risk from fluvial flooding include Robertsbridge, Salehurst, Etchingham and Rye. Flooding from ordinary watercourses is also identified to impact Little Common, Sedlescombe and land in-between Penhurst and Ponts Green.

13.2.3 Tidal flood risk

Rother District is bounded to the south by the English Channel. As such, the coastline is at risk of tidal flooding. A number of tidal flood events have been recorded in Camber and Rye Harbour due to overtopping of defences.

Appendix C shows the tidal Flood Zones and Appendix D includes the effect of climate change on the tidal flood risk.

The tidal flood risk to the Local Plan area has been based on the Romney Marsh Coastal model and the East Sussex Coastal modelling (consists of the Eastbourne and Combe Haven models). The River Rother, Brede, Tillingham, Combe Haven, East Stream and Picknell Green Stream are all at risk of tidal flooding in their lower reaches.

13.2.4 Coastal flood risk

In coastal locations the risk of flooding is linked to the stability of the coastline. If the coast is eroding, then the potential effect is that tidal flood defences near to the sea will be lost and flood risk will increase.

The **South Foreland to Beachy Head Shoreline Management Plan** identifies a total of 3,200 'at risk' properties that will be protected by the works proposed to manage and mitigate the risk of coastal erosion and flooding over the next 100-years. A number of these are located within the Local Plan area including Cliff End, Winchelsea Beach, Rye Harbour, Bexhill and Camber.

13.2.5 Surface water flood risk

The Risk of Flooding from Surface Water dataset shows that surface water predominantly follows topological flow paths of existing watercourses, dry valleys or roads, with some areas of ponding upslope of topographic features including railway lines and roads. The areas of greatest risk within the Local Plan area include properties within Bexhill, Rye and Battle.

High groundwater can increase surface water risk. This is largely present on the marshland along the Rother coastline, where the water table lies close to the surface increasing ground saturation. Tide locking is also an issue where high tides prevent surface water from draining from gravity outfalls along the defended coastal plain.

Surface water climate change modelling shows that several areas across Rother District are sensitive to climate change, with greater flood extents and depths predicted in several areas, including Bexhill, Rye and Battle.

13.2.6 Groundwater flood risk

The JBA Groundwater Flood Map identifies the majority of Rother District to be at a negligible risk of groundwater flooding. Localised areas of higher risk are located in the lower catchment of Rother. In particular, areas of highest risk are located in marshland surrounding Rye Harbour and Camber where there is a potential tidal impact on groundwater levels.

It should be noted that as this information is based on a national dataset there may be localised differences in groundwater flood risk. Planners and developers should consult the LLFA to find out if they hold any local information.

13.2.7 Sewer flood risk

Historical incidents of sewer flooding are detailed by the Southern Water's SIRF. This database records incidents of flooding related to public foul, combined or surface water sewers and identifies which areas have been impacted by flooding. A total of 5,171 incidents have been recorded in Rother District over the last 40 years. It has been identified that the areas of Bexhill-on-Sea, Battle, Rye and Robertsbridge are the most susceptible to issues of sewer flooding.

13.2.8 Flooding from Reservoirs

Outlines from the Risk of Flooding from Reservoirs dataset (informed from the Reservoir Flood Mapping) shows the inundation extents of seven reservoirs impacting the Local Plan area. Areas at risk of 'wet day' reservoir flooding s include Robertsbridge, Etchingham, Rye and Bexhill. Areas at risk of 'dry day' reservoir flooding include Robertsbridge, Etchingham and the Brede valley.

13.3 Flood defences

A high-level review of formal flood defences was carried out using existing information to provide an indication of their condition and standard of protection. Details of the flood defence locations and condition were provided by the Environment Agency and derived from the River Brede Fluvial Model (2018) for the purpose of preparing this assessment and can be found in Appendix J.

All main rivers in the Rother District have fluvial defences along their lengths. The River Rother also has tidal and tidal/ fluvial defences situated in its lower reaches. The defences largely consist of embankments and areas of high ground. The majority of the coastline in Rother District is protected by coastal defences including beaches, dunes, cliffs and flood walls. Most of the flood defences provide a standard of protection between 20% and 50% (i.e. protection will be provided for an event with an annual exceedance probability of up to 50%). Many of the defences are classed as "high ground" which can be the natural ground level, and therefore these defences have a relatively low standard of protection. However, those located along the coastline and the tidal reach of the River Romney offer a greater standard of protection up to 0.25%. The Environment Agency defence data shows that most defences within the Local Plan area are in a 'Very good', 'Good' or 'Fair' condition.

13.4 Key policies

There are many relevant regional and local key policies which have been considered within the SFRA, such as the Shoreline Management Plans for South Foreland to Beachy Head, the Rother and Romney, Cuckmere and Sussex Havens and Medway Catchment Flood Management Plans, the South East River Basin Management Plan, the East Sussex Preliminary Flood Risk Assessment, and Local Flood Risk Management Strategy. Other policy considerations have also been incorporated, such as sustainable development principles, climate change and flood risk management.

13.5 Development and flood risk

The Sequential and Exception Test procedures for both Local Plans and Flood Risk Assessments have been documented, along with guidance for planners and developers. Links have been provided for various guidance documents and policies published by other Risk Management Authorities, such as the LLFA and the Environment Agency.

14 Recommendations

A review of national and local policies has been conducted against the information collected on flood risk in this SFRA. Following this, several recommendations have been made for Rother District Council to consider as part of Flood Risk Management in the study area.

14.1 Recommendations for development and flood risk in the District

14.1.1 Reduction of flood risk through site allocations and appropriate site design

- Locate new development in areas of lowest risk from all sources, now and in the future, in line with the Sequential Test. If a Sequential Test is undertaken and a site at risk of flooding is identified as the only appropriate site for the development, the Exception Test shall be undertaken.
- After application of Exception Test, a sequential approach to site design must be used to reduce risk. Any re-development within areas of flood risk which provide other wider sustainability benefits should provide flood risk betterment and be made resilient to flooding.
- Identify long-term opportunities to remove development from the floodplain and to make space for water.
- Ordinary watercourses not currently afforded flood maps should be modelled to an appropriate level of detail to enable a sequential approach to the layout of the development.
- Differences in flood extents from climate change should be considered by the Council when allocating sites, to understand how much additional risk there could be, where this risk is in the site, whether the increase is marginal or activates new flow paths, whether it affects access/ egress and how much land could still be developable overall
- Ensure development is 'safe', dry pedestrian egress from the floodplain and emergency vehicular access should be possible for all residential development. If at risk, then an assessment should be made to detail the flood duration, depth, velocity and flood hazard rating in the 1% AEP plus climate change fluvial flood event and the 0.5% AEP plus climate change tidal event, in line with FD2320.
- Where there is a residual risk of flooding (from any source) to properties within a development, residential and commercial finished floor levels should be a minimum of whichever is higher of 600mm above the average ground level of the site, adjacent road level, or estimated river or sea flood level for the site. Where there is a level of certainty about the estimated flood level, it may be appropriate to reduce this to 300mm. If there is a particularly high level of uncertainty it may need to be increased. If it is not possible to raise floor levels to those specified above, you will need to either raise them as much as possible, consider moving vulnerable uses to upper floors, or include extra flood resistance and resilience measures.
- Protect and Promote Areas for Future Flood Alleviation Schemes.
- Safeguard functional floodplain (Flood Zone 3b in Appendix C) from future development.
- Identify opportunities for brownfield sites at risk of flooding to reduce risk and provide flood risk betterment elsewhere, for example, by incorporating flood storage into sites.

- Identify opportunities to help fund future flood risk management through developer contributions (S106 and Community Infrastructure Levy) to reduce risk for surrounding areas.
- Seek opportunities to make space for water to accommodate climate change.

14.1.2 Promote SuDS to mimic natural drainage routes to improve water quality

- SuDS design should demonstrate how constraints have been considered and how the design provides multiple benefits e.g. landscape enhancement, biodiversity, recreation, amenity, leisure and the enhancement of historical features.
- Planning applications for phased developments should be accompanied by a Drainage Strategy, which takes a strategic approach to drainage provision across the entire site and incorporates adequate provision for SuDS within each phase.
- Use of the SuDS management train to prevent and control pollutants to prevent the 'first flush' polluting the receiving waterbody.
- SuDS are to be designed so that they are easy to maintain, and it should be set out who will maintain the system, how the maintenance will be funded and should be supported by an appropriately detailed maintenance and operation manual.

14.1.3 Reduce surface water runoff from new developments and agricultural land

- SuDS should be considered and implemented as part of all new development, in line with the **Guide to Sustainable Drainage Systems in East Sussex document** which can be found on East Sussex County Council's **Sustainable Drainage Systems** webpage.
- Space should be provided for the inclusion of SuDS on all allocated sites and outline proposals
- Promote biodiversity, habitat improvements and **Countryside Stewardship schemes** to help prevent soil loss and to reduce runoff from agricultural land

14.1.4 Enhance and restore river corridors and habitat

- Liaise with other asset owners to assess condition of existing assets and upgrade, if required, to ensure that the infrastructure can accommodate pressures / flows for the lifetime of the development.
- Natural drainage features should be maintained and enhanced.
- Identify opportunities for river restoration / enhancement to make space for water.
- A presumption against culverting of open watercourses except where essential to allow highways and / or other infrastructure to cross, in line with CIRIA's Culvert screen and outfall manual, (C786 PR) and to restrict development over culverts.
- There should be no built development within 8m from the top of a Main River or ordinary watercourses outside of IDB areas within the Local Plan area. No built development should take place within 8m of a watercourse within the Romney Marshes Area IDB and 9m from any flood risk management structure (including ordinary watercourses) within the Pevensey and Cuckmere Water Level Management Board where these are

maintained by the Board. These restrictions are in place for the preservation of the watercourse corridor, wildlife habitat, flood flow conveyance and future watercourse maintenance or improvement.

- There should be no built development within 15m of the foot of the landward side of any sea defences or between the low water mark of medium tides and the seaward side of any sea defence.

14.1.5 Mitigate against risk, improved emergency planning and flood awareness

- Work with emergency planning colleagues and stakeholders to identify areas at highest risk and locate most vulnerable receptors away from these areas.
- Exceedance flows, both within and outside of the site, should be appropriately designed to minimise risks to both people and property.
- For a partial or completely pumped drainage system, an assessment should be undertaken to assess the risk of flooding due to any failure of the pumps. The design flood level should be determined if the pumps were to fail; if the attenuation storage was full, and if a design storm occurred.
- An emergency overflow should be provided for piped and storage features above the predicted water level arising from a 100-year rainfall event, inclusive of climate change and urban creep.
- Consideration and incorporation of flood resilience measures up to the 1 in 1,000-year event.
- Ensure robust emergency (evacuation) plans are produced and implemented for major developments.
- Increase awareness and promote sign-up to the Environment Agency Flood Warnings Direct (FWD) within Rother District.

14.1.6 Internal Drainage Boards

When carrying out development within the Pevensey and Cuckmere Water Level Management Board district or the Romney Marshes Area Internal Drainage Board district developers should:

- Consult with (where relevant) Romney Marshes Area Internal Drainage Board and Pevensey and Cuckmere Water Level Management Board at an early stage to discuss flood risk including requirements for site-specific Flood Risk Assessments, detailed hydraulic modelling, and drainage assessment and design.

For development outside of these IDBs but where the site is intended to discharge into a hydrological catchment of the Boards developers should:

- Consult with (where relevant) Romney Marsh Area Internal Drainage Board and Pevensey and Cuckmere Water Level Management Board at an early stage to discuss whether a site-specific FRA is required.
- Consult with (where relevant) Romney Marsh Area Internal Drainage Board and Pevensey and Cuckmere Water Level Management Board at an early stage to confirm the maximum discharge rate from the site.
- Pay the necessary discharge consents.

14.2 Local Plan policy recommendations

The **Rother District Local Plan Core Strategy** contains various strategic policies relating to flood risk management and development. These include EN6, covering the

need to protect communities wherever practical from flooding to a level that accounts for future climate change, Policy EN7, covering the need to account for flood risk at all stages of the planning process to build in resilience to anticipated climatic changes, and Policy SRM2 covering the need to manage surface water quantity, rate and quality through sustainable drainage systems (SuDS).

The **Development and Site Allocations Local Plan (DaSA)** also contains detailed policies relating to development management. These policies include DEN5 which covers the use of SuDS and DEN6 which relates to the impacts of infiltration systems on ground stability in Pett and Fairlight.

A review of these policies has been carried out against the findings of this SFRA. Rother District Council should consider whether the following additional policies and/or updates to existing policies should be incorporated into their new Local Plan:

14.2.1 Buffer Strips Policy

The provision of buffer strips is important in preserving watercourse corridors, flood flow conveyance and future watercourse maintenance and improvement. It also enables the avoidance of disturbing ecology and the structural integrity of riverbanks.

Developers should:

- Not build within 8m from the edge of bank of any Ordinary Watercourse within the District
- Not build within 8m from the edge of bank of any Main River within the District in accordance with the Environment Permitting Regulations (2016).
- Maintain a minimum distance of 8m between development and the edge of bank of any Ordinary Watercourse within the Romney Marshes Area IDB maintained by the board, or 9m from the edge of any drainage or flood risk management infrastructure (including ordinary watercourses) within the PCWLMB district where it is maintained by the Board, in accordance with local Byelaws.
- Seek opportunities on a site by site basis to increase these buffer distances to 'make space for water', allowing additional capacity to accommodate climate change.

14.2.2 Coastal Flood Risk Policy

- Under the **South Foreland to Beachy Head Shoreline Management Plan** (SMP) a 'no active intervention' approach is followed between Cliff End and Fairlight Cove and at Fairlight Cove West resulting in continued cliff erosion and land loss. Therefore, it is recommended that the area shown to be at risk of erosion by 2105 in **Appendix C of the SMP** is designated as a **Coastal Change Management Area** and appropriate policies with regards to future developments (including extensions, caravan sites etc.) and support with long term adaptation for existing communities are developed.
- Section 2.3.7 outlines the existing draft policy for Coastal Change Management Areas (CCMA). Policies for CCMAs will be delivered through the Local Plan, and developers should refer to these.

14.2.3 Sustainable Drainage Policy (additions to Policy DEN5)

- Whilst Policy DEN5 does not apply a threshold for its application, space should be provided for the inclusion of SuDS on all allocated sites and outline proposals, including non-major development.
- Planning applications for phased developments should be accompanied by a Drainage Strategy, which takes a strategic approach to drainage

provision across the entire site and incorporates adequate provision for SuDS within each phase.

Opportunities should be considered to integrate SuDS into green infrastructure and open spaces.

14.3 Cumulative Impact assessment recommendations

The cumulative impact of development should be considered at the planning application and development design stages and the appropriate mitigation measures undertaken to ensure flood risk is not exacerbated, and in many cases the development should be used to improve the flood risk.

14.3.1 Broadscale recommendations

The broadscale cumulative impact assessment for Rother has highlighted the potential for development to have a cumulative impact on flood risk. Catchments have been identified as high, medium or low risk.

New development can potentially increase flood risk and thus the need for incremental action and betterment in flood risk terms across all of Rother is appropriate.

The following policy recommendations therefore apply to all catchments within the study area:

- RDC should work closely with neighbouring local authorities to develop complementary Local Planning Policies for catchments that drain into and out of the District to other local authorities in order to minimise cross boundary issues of cumulative impacts from development.
- Developers should incorporate SuDS and provide details of adoption, ongoing maintenance and management on all development sites. Proposals will be required to provide reasoned justification for not using SuDS techniques, where ground conditions and other key factors show them to be technically feasible. Preference will be given to systems that contribute to the conservation and enhancement of biodiversity and green infrastructure in the districts where practicable. Developers should refer to the relevant **LLFA guidance** for the requirements for SuDS in the Rother, including Technical and Development Type-specific Guidance for Developers. Further guidance on SuDS can be found in Section 9.
- ESCC as LLFA will review Surface Water Drainage Strategies in accordance with their local requirements for major developments (in line with their statutory duty). These should take into account all sources of flooding so that future development is resilient to flood risk and does not increase flood risk elsewhere.
- Where appropriate, the opportunity for Natural Flood Management in rural areas, SuDS retrofit in urban areas and river restoration should be maximised. Culverting should be opposed, and day-lighting existing culverts promoted through new developments.
- Encourage runoff from new developments to be restricted to less than greenfield rates to account for existing surface water runoff problems. Developers should refer to the relevant LLFA guidance for the requirements for **SuDS in Rother.**
- Where applicable, development proposals should undertake a site-specific Flood Risk Assessment. Site-specific FRAs should explore opportunities to provide wider community flood risk benefit through new developments. Measures that can be put in place to contribute to a reduction in flood risk

downstream should be considered. This may be either by provision of additional storage on site e.g. through oversized SuDS, natural flood management techniques, green infrastructure and green-blue corridors, and/ or by providing a Partnership Funding contribution towards any flood alleviation schemes.

- RDC should consider requiring developers to contribute to community flood defences outside of their red line boundary to provide wider benefit and help offset the cumulative impact of development. There are proposed and ongoing Flood Alleviation Schemes which may help to reduce fluvial risk in the district, and there may be opportunities for development to support the funding/delivery of these schemes.
- Catchment-specific recommendations are made for high and medium-risk catchments below.
- LPAs should work closely with the EA and the LLFA to identify any areas of land that should be safeguarded for any future flood alleviation schemes and natural flood management features.
- There is the potential for development in these catchments to contribute towards works to reduce flood risk and enable regeneration as well as contributing to the wider provision of green infrastructure.

14.3.2 Recommendations for developments in high-risk catchments

- LLFAs and LPAs should work closely with the EA and the LLFA to identify any areas of land that should be safeguarded for any future flood alleviation schemes and natural flood management features. **The Working with Natural Processes mapping** shows there are opportunities for floodplain reconnection, riparian woodland and additional floodplain woodland in high risk catchments. The mapping also indicates locations where there are potential for runoff attenuation features to reduce flows. These areas should all be safeguarded.
- The LPAs should explore the potential for development in High-Risk catchments to contribute towards works to reduce flood risk and enable regeneration as well as contributing to the wider provision of green infrastructure.
- Within any FRAs consideration should be given to the potential cumulative effects of all proposed development and how this affects sensitive receptors.
- Developers should also include a construction surface water management plan to support the Construction Drainage Phasing Plan. This should provide information to the EA, the LLFA and the LPA regarding the proposed management approach during the construction phase to address surface water management during storm events.
- The LLFA and LPA should consult with Local Non-For-Profit organisations such as wildlife trusts, rivers trusts and catchment partnerships to understand ongoing and upcoming projects where NFM, flood storage and attenuation, and environmental betterment may be possible alongside developments and aid in reducing flood risk.

APPENDICES

Offices at

Coleshill
Doncaster
Dublin
Edinburgh
Exeter
Glasgow
Haywards Heath
Isle of Man
Limerick
Newcastle upon Tyne
Newport
Peterborough
Saltaire
Skipton
Tadcaster
Thirsk
Wallingford
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